
MEDICO-CHIRURGICAL SOCIETY
EDINBURGH

THE TRANSACTIONS

OF THE

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

THE TRANSACTIONS

OF THE

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

VOL. V.—NEW SERIES.

SESSION 1885-86.

EDINBURGH: OLIVER AND BOYD,
PUBLISHERS TO THE SOCIETY.
1886.

PRINTED BY OLIVER AND BOYD, TWEEDDALE COURT, EDINBURGH.

PREFACE.

THE present Volume is the *Fifth* of the *New Series*, and contains a record of the work done during the past Session.

That work, as hitherto, embraces the communication of Original Papers; the exhibition of Patients, illustrating rare and interesting forms of disease; and the exhibition of Pathological and other specimens, so essential to the proper understanding of the morbid changes which take place in the human body.

During the past Session several Extra Meetings were held for Clinical and Pathological Demonstrations, and two Extra Meetings were also held for Discussions on Special Subjects,—one on the Medical Arrangements of an English Army Corps, introduced by Surgeon-Major Evatt, M.D.; and the other on Abdominal Section, introduced by Mr Lawson Tait. It is hoped that such Meetings will materially increase the usefulness of the Society.

It is believed that the publication of the Transactions in this permanent form will prove a valuable contribution to medical literature, will encourage the Members to take a more active part in the work of the Society, and will tend in no small degree to increase the influence and usefulness of the Medico-Chirurgical Society of Edinburgh.

WILLIAM CRAIG.
Editor.

October 1886.

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	Alexander Fergusson, M.D., F.R.C.S. Ed., Peebles,	1882
	John Archibald, M.B., F.R.C.S. Ed.,	1882
	James Maxwell Ross, M.B., F.R.C.S. Ed., 112 Gilmore Place,	1882
135	John Carlyle Johnstone, M.B., C.M., Melrose Asylum,	1882
	James Rutherford Morison, M.D., F.R.C.S. Ed., Hartlepool,	1882
	Roderick Maclaren, M.D., 23 Portland Square, Carlisle,	1882
	W. Wotherspoon Ireland, M.D., Prestonpans,	1883
	Francis Mitchell Caird, M.B., F.R.C.S. Ed., 8 Torphichen St.	1883
140	F. W. Dyce Fraser, M.D., F.R.C.P. Ed., 20 Chester Street,	1883
	Robert Henry Blaikie, M.D., F.R.C.S. Ed., 5 Newington Road,	1883
	R. M'Kenzie Johnston, M.D., F.R.C.S. Ed., 5 Rutland Square,	1883
	Charles Walker Cathcart, M.B., F.R.C.S. Ed., 44 Melville Street, *Secretary*,	1883
	Alexander Bruce, M.B., F.R.C.P. Ed., 13 Alva Street,	1883
145	Andrew Semple, M.D., F.R.C.S. Ed., Dep. Surgeon-General, 33 Queen Street,	1883
	William Hy. Shirreff, M.B., C.M.,	1883
	John Lyon Wilson, L.R.C.P. Ed., 44 South Clerk Street,	1883
	Donald MacRaild, F.R.C.S. Ed., Greenock,	1883
	Henry Newcombe, M.D., F.R.C.S. Ed., 5 Dalrymple Crescent,	1883
150	* Francis Troup, M.D. M.R.C.P. Ed., 1 Minto Street,	1883
	Russell Eliott Wood, M.B., F.R.C.S. Ed., 9 Darnaway Street,	1883

		Date of Admission.
	John Macdonald Brown, M.B., F.R.C.S. Ed., 6 Atholl Place,	1883
	James William Beeman Hodsdon, M.D., F.R.C.S. Ed., 30 Walker Street,	1883
	John Haddon, M.D., C.M., Honeyburn, Hawick,	1883
155	Germon Sims Woodhead, M.D., F.R.C.P. Ed., 6 Marchhall Crescent,	1883
	Thomas Francis Spittal Caverhill, M.B., F.R.C.P. Ed., 8A Abercromby Place,	1883
	Robert Alexander Lundie, M.B., B.Sc., F.R.C.S. Ed., 35 Warrender Park Road,	1883
	Arthur W. Hare, M.B., F.R.C.S. Ed., M.R.C.S. Eng., 21 Ainslie Place,	1883
	Edwin Baily, M.B., C.M., Oban,	1883
160	Alexander Black, M.B., F.R.C.P. Ed., 8 St Vincent Street,	1883
	Harry Melville Dunlop, M.B., C.M., 20 Abercromby Place,	1883
	George Andreas Berry, M.B., F.R.C.S. Ed., 23 Rutland Street,	1883
	Hamilton Wylie, M.B., C.M., 1 George Place,	1883
	James Bennet, M.B., C.M., F.R.C.S. Ed., 49 Charlotte Street, Leith,	1883
165	Arthur Douglas Webster, M.D., M.R.C.P. Ed., 20 Newington Road,	1883
	Robert William Philip, M.B., C.M., 12 Hope Street,	1883
	William M'Neil, M.D., Stranraer,	1883
	Joseph Carne Ross, M.D., F.R.C.P. Ed., Penzance,	1884
	William Russell, M.B., M.R.C.P. Ed., 46 Albany Street,	1884
170	George Dickson, M.D., F.R.C.S. Ed., 9 India Street,	1884
	Thomas Wyld Pairman, L.R.C.P. & S. Ed.,	1884
	Alexander Thom, jr., M.D., C.M., Crieff,	1884
	Hugh Logan Calder, M.D., C.M., 42 Leith Walk,	1884
	James Craig Balfour, L.R.C.P. & S. Ed., 25 Minto Street,	1884
175	Frederick Anastasius Saunders, L.R.C.P. & S. Ed., Denburn, Crail,	1884
	William Richardson, F.R.C.S. Ed., Bath Lodge, Reading,	1884
	Andrew Brown, M.D., M.R.C.P. Ed., 1 Bartholomew Road, Kentish Town, London, N.W.	1884
	G. J. H. Bell, M.B., C.M.,	1884
	T. Goodall Nasmyth, M.B., C.M., Cowdenbeath, Fife,	1884
180	Henry Hay, M.B., C.M., 7 Brandon Street,	1884
	Thomas R. Scott, M.D., C.M., Musselburgh,	1884
	R. Milne Murray, M.B., F.R.C.P. Ed., 10 Hope Street,	1884
	A. Murray Gibson, M.D., Portobello,	1884
	A. S. Cumming, M.D., C.M., 18 Ainslie Place,	1884
185	Ernest F. Neve, M.D., F.R.C.S. Ed., M.R.C.S. Eng., The Cowgate Dispensary,	1884
	W. C. Greig, M.B., C.M., 13 Arniston Place,	1884
	William Wilson, M.B., C.M., 21 Young Street,	1885
	John Mowat, M.D., 1 Hope Park Terrace,	1885
	Skene Keith, M.B., F.R.C.S. Ed., 2 North Charlotte Street,	1885
190	D. Noël Paton, M.D., C.M., 21 Maitland Street,	1885
	George Hugh Mackay, M.B., C.M., Elgin,	1885
	J. Michael Dewar, M.B., C.M., 110 Lauriston Place,	1885
	Edward M'Callum, F.R.C.S. Ed., 3 Brandon Street,	1885
	T. Edgar Underhill, M.D., F.R.C.S. Ed., Tipton Green, Staffordshire,	1885
195	John Struthers Stewart, L.R.C.P. & S. Ed., 16 Merchiston Terrace,	1885
	Allen Thomson Sloan, M.D., C.M., 22 Forth Street,	1885
	John William Ballantyne, M.B., C.M., 50 Queen Street,	1885
	James Robertson Crease, F.R.C.S. Ed., 2 Ogle Terrace, South Shields,	1885
	George Kerr, M.B., C.M., 9 Great Stuart Street,	1885
200	Tom Bairstow, L.R.C.P. & S. Ed., 13 Buccleuch Place,	1885

		Date of Admission.
	David Milligan, M.B., C.M., 7 West Maitland Street,	1885
	George Dods, M.D., L.R.C.S. Ed., 36 Moray Place,	1885
	J. Murdoch Brown, M.B., F.R.C.P. Ed., 9 Walker Street,	1885
	Robert W. Felkin, M.D., F.R.C.S. Ed., 20 Alva Street,	1885
205	S. Hall Puckle, M.B., C.M., 32 Morningside Road,	1885
	James Haig Ferguson, M.B., C.M., M.R.C.S. Eng., 6 Maitland Street,	1885
	Charles Kennedy, M.D., C.M., 25 Newington Road,	1886
	William Gayton, M.D., M.R.C.S. Eng., Bartram Lodge, Fleet Road, Hampstead, London, N.W.,	1886
	Reginald Ernest Horsley, M.B., C.M., 13 Great Stuart Street,	1886
210	James Mill, M.B., C.M., 34 Summerside Street,	1886
	Robert Fraser Calder Leith, M.B., B.Sc., 107 Marchmont Road,	1886
	Thomas M. Burn-Murdoch, M.B., C.M., 31 Morningside Road,	1886
	Professor William Smith Greenfield, M.D., F.R.C.P. Lond. and Ed., 7 Heriot Row,	1886
	Oswald Gillespie Wood, M.D., F.R.C.S. Ed., Surgeon, Army Medical Staff, The Castle,	1886
215	James Hogarth Pringle, M.B., C.M., 5 Livingstone Place,	1886
	Nathaniel Thomas Brewis, M.B., C.M., 59 Queen Street,	1886
	John Batty Tuke, Jr., M.B., C.M., Balgreen, Murrayfield,	1886
	David Berry Hart, M.D., F.R.C.P. Ed., 4 Wemyss Place,	1886
	Walter Scott Lang, M.D., F.R.C.S. Ed., M.R.C.S. Eng., 1 Leopold Place,	1886

NON-RESIDENT.

220	Arthur Edward Turnour, M.D., M.R.C.S. Eng., *Denbigh*,	1843
	W. Ord M'Kenzie, M.D., L.R.C.S. Ed., *London*,	1845
	W. Judson Van Someren, M.D., L.R.C.S. Ed., *Redhill, Surrey*,	1845
	William H. Lowe, M.D., F.R.C.P. Ed., *Wimbledon*,	1845
	George Skene Keith, M.D., F.R.C.P. Ed., *Currie*,	1845
225	W. Chalmers Fowler, M.D., M.R.C.S. Eng., *London*,	1847
	Veitch Sinclair, L.R.C.P. and S. Ed., *London*,	1850
	Andrew Graham, M.D., Fleet Surgeon, R.N.,	1853
	Archibald Hall, M.D., *Montreal*,	1853
	John Traill, F.R.C.S. Ed., *Arbroath*,	1853
230	W. Overend Priestly, M.D., LL.D., F.R.C.P. Ed., *London*,	1854
	Horatio Robinson Storer, M.D., *Newport, Rhode Island, U.S.*,	1855
	James C. Howden, M.D., *Montrose*,	1856
	Thomas Skinner, M.D., L.R.C.S. Ed., *London*,	1856
	Professor William Smoult Playfair, M.D., F.R.C.P.L., *London*,	1857
235	J. Ivor Murray, M.D., F.R.C.S. Ed., *Scarboro'*,	1857
	Andrew Scott Myrtle, M.D., L.R.C.S. Ed., *Harrogate*,	1859
	Robert Foulis, M.D., F.R.C.S. Ed., *Cupar-Fife*,	1859
	Francis Robertson Macdonald, M.D., *Inveraray*,	1860
	Professor John Young, M.D., *University of Glasgow*,	1860
240	Norman Bethune, M.D., F.R.C.S. Ed., *Toronto*,	1861
	George Thin, M.D., L.R.C.S. Ed., *London*,	1861
	Peter Gordon, L.R.C.P. and S. Ed., *Juniper Green*,	1861
	J. Cecil Phillippo, M.D., *Kingston, Jamaica*,	1861
	Professor William Stephenson, M.D., F.R.C.S. Ed., *Aberdeen*,	1861
245	David Yellowlees, M.D., F.F.P.S. Glasg., *Glasgow*,	1862
	William M'Cullock Watson, M.D., *Montrose*,	1863
	Prof. Arthur Gamgee, M.D., F.R.C.P. Ed., F.R.S., *St Leonards-on-Sea*,	1864
	Professor John Cleland, M.D., LL.D., *The University, Glasgow*,	1864
	R. B. Finlay, M.D., M.P., *Middle Temple, London*,	1864
250	Stanley Lewis Haynes, M.D., M.R.C.S. Eng., *Malvern*,	1864
	Francis D. A. Skae, M.D., *Lerwick*,	1864
	James Watt Black, M.D., F.R.C.P.L., *London*,	1865

		Date of Admission.
	David Brodie, M.D., *Canterbury*,	1865
	Thomas Sheriff, L.R.C.P. and S. Ed., *Edinburgh*,	1867
255	Peter Maury Deas, M.B., L.R.C.S. Ed., *Exeter*,	1868
	Lauchlan Aitken, M.D., C.M., *Rome*,	1868
	Professor J. G. M'Kendrick, M.D., F.R.C.P. Ed., *University, Glasgow*,	1870
	Lawson Tait, F.R.C.S. Ed. and Eng., *Birmingham*,	1870
	J. G. Sinclair Coghill, M.D., F.R.C.P. Ed., *Ventnor*,	1870
260	James Johnston, M.D., L.R.C.S. Ed., *Shanghai*,	1871
	J. William Eastwood, M.D., M.R.C.P.L., *Darlington*,	1871
	Professor J. Bell Pettigrew, M.D., LL.D., F.R.C.P. Ed., *University of St Andrews*,	1873
	John Smith,	1873
	John Aymers Macdougall, M.D., F.R.C.S. Ed., *Carlisle*,	1875
265	Thomas John Maclagan, M.D., M.R.C.P.L., *London*,	1875
	Dr Groesbeck, *Cincinnati*,	1875
	Professor F. S. B. de Chaumont, M.D., F.R.C.S. Ed., *Netley*,	1876
	Professor David James Hamilton, M.B., F.R.C.S. Ed., *Aberdeen University*,	1876
	J. Moolman, M.B., C.M., *Cape of Good Hope*,	1877
270	Robert Somerville, M.D., L.R.C.S. Ed., *Galashiels*,	1877
	Graham Steell, M.D., M.R.C.P.L., *Manchester*,	1877
	Frederick William Barry, M.D., D.Sc., *London*,	1878
	Thomas Inglis, F.R.C.P. Ed., *Lincoln*,	1878
	John Brown, M.D., F.R.C.S. Eng., *Burnley*,	1878
275	Walter Weir, M.B., F.R.C.P. Ed., *London*,	1879
	Keith Norman Macdonald, M.D., F.R.C.P. Ed., *Cupar-Fife*,	1880
	John Home Hay, M.D., M.R.C.S. Eng., *Alloa*,	1880
278	John Mackay, M.D., L.R.C.S. Ed., *Aberfeldy*,	1881

ORDINARY MEMBERS,

ARRANGED ALPHABETICALLY.

RESIDENT.

	Dr J. O. Affleck, 38 Heriot Row,	1871
	Dr James Andrew, 2 Atholl Crescent,	1869
	Professor Annandale, 34 Charlotte Square,	1863
	Dr Archibald,	1882
5	Dr W. Badger, Penicuik,	1882
	Dr J. Johnson Bailey, Marple, Cheshire,	1874
	Dr Edwin Baily, Oban,	1883
	Tom Bairstow, Esq., 13 Buccleuch Place,	1885
	Dr Andrew Balfour, Portobello,	1874
10	Dr J. H. Balfour, Portobello,	1881
	Dr G. W. Balfour, 17 Walker Street,	1874
	Dr James Craig Balfour, 25 Minto Street,	1884
	Dr Thomas Balfour, 51 George Square,	1856
	Dr Alexander Ballantyne, Dalkeith,	1872
15	Dr J. W. Ballantyne, 50 Queen Street,	1885
	Dr A. H. Freeland Barbour, 24 Melville Street,	1881
	Dr G. J. H. Bell,	1884
	Joseph Bell, Esq., 2 Melville Crescent,	1862
	Dr James Bennet, 49 Charlotte Street, Leith,	1883
20	G. H. Bentley, Esq., Kirkliston,	1877
	Dr G. A. Berry, 23 Rutland Street,	1883
	Dr James S. Beveridge, 8 Eildon Street,	1861
	Dr Alexander Black, 8 St Vincent Street,	1883
	Dr W. T. Black, 2 George Square,	1877
25	Dr Robert H. Blaikie, 5 Newington Road,	1883
	Dr Bleloch, 2 Lonsdale Terrace,	1871

		Date of Admission.
	Dr Brakenridge, 10 St Colme Street,	1865
	Dr Byrom Bramwell, 23 Drumsheugh Gardens,	1876
	Dr N. T. Brewis, 59 Queen Street,	1886
30	Dr Brown, 1 Bartholomew Road, Kentish Town, London,	1884
	Dr J. Graham Brown, 16 Ainslie Place,	1878
	Dr J. Macdonald Brown, 6 Atholl Place,	1883
	Dr J. Murdoch Brown, 9 Walker Street,	1885
	William Brown, Esq., 25 Dublin Street,	1821
35	Dr Alexander Bruce, 13 Alva Street,	1883
	Dr Robert Bruce, 12 York Place,	1858
	Dr Buist, 1 Clifton Terrace,	1877
	Dr T. M. Burn-Murdoch, 31 Morningside Road,	1886
	Dr Cadell, 5 Castle Terrace,	1870
40	Dr Francis M. Caird, 8 Torphichen Street,	1883
	Dr H. L. Calder, 42 Leith Walk,	1884
	Dr W. Watson Campbell, Duns,	1877
	Dr Cappie, 47 Lauriston Place,	1855
	Dr J. Carmichael, 22 Northumberland Street,	1870
45	Dr C. W. Cathcart, 44 Melville Street, *Secretary*,	1883
	Dr T. F. S. Caverhill, 8A Abercromby Place,	1884
	Professor John Chiene, 26 Charlotte Square,	1867
	Dr Church, 36 George Square,	1876
	Dr Clouston, Tipperlinn House, Morningside Place,	1861
50	Dr A. R. Coldstream, Florence,	1878
	Dr John Connel, Peebles,	1876
	Dr Cotterill, 23 Walker Street,	1878
	Dr William Craig, 7 Bruntsfield Place,	1869
	Dr J. R. Crease, 2 Ogle Terrace, South Shields,	1885
55	Dr Halliday Croom, 25 Charlotte Square,	1870
	Dr A. S. Cumming, 18 Ainslie Place,	1884
	Dr R. J. B. Cunynghame, 6 Walker Street,	1868
	Dr J. M. Dewar, 110 Lauriston Place,	1885
	Dr Archibald Dickson, 11 Royal Circus,	1871
60	Dr George Dickson, 9 India Street,	1884
	Dr George Dods, 36 Moray Place,	1885
	Dr Halliday Douglas, 30 Melville Street,	1842
	Dr William B. Dow, Dunfermline,	1879
	Dr John Duncan, 8 Ainslie Place, *Vice-President*,	1868
65	Dr Kirk Duncanson, 22 Drumsheugh Gardens,	1871
	Dr H. M. Dunlop, 20 Abercromby Place,	1883
	Dr J. Dunsmure, 53 Queen Street,	1872
	C. H. Fasson, Esq., Dep. Surg.-Gen., Royal Infirmary,	1879
	Dr R. W. Felkin, 20 Alva Street,	1885
70	Dr J. Haig Ferguson, 6 Maitland Street,	1885
	Dr Alexander Fergusson, Peebles,	1882
	Dr W. A. Finlay, St Helens, Russell Place,	1875
	Dr Andrew Fleming, 8 Napier Road,	1880
	Dr Foulis, 34 Heriot Row,	1875
75	Dr F. W. Dyce Fraser, 20 Chester Street,	1883
	Dr John Fraser, 19 Strathearn Road,	1878
	Professor Thomas R. Fraser, 37 Melville Street,	1865
	Dr R. Freeland, Broxburn,	1879
	Dr Garland, 35 Charlotte Street, Leith,	1873
80	Dr W. Gayton, Bartram Lodge, Fleet Road, Hampstead, London, N.W.,	1886
	Dr A. Murray Gibson, Portobello,	1884
	Dr G. A. Gibson, 17 Alva Street,	1880
	Dr James D. Gillespie, 10 Walker Street,	1852
	G. R. Gilruth, Esq., 67 York Place,	1869
85	Dr J. Allan Gray, 107 Ferry Road,	1879
	Professor Greenfield, 7 Heriot Row,	1886
	Dr David Greig, 38 Coates Gardens,	1854

		Date of Admission.
	Dr W. C. Greig, 13 Arniston Place,	1884
	Dr R. H. Gunning, 30 Hazlitt Road, West Kensington, London,	1846
90	Dr John Haddon, Honeyburn, Hawick,	1883
	Dr Haldane, 22 Charlotte Square,	1853
	Dr A. W. Hare, 21 Ainslie Place,	1883
	Dr D. Berry Hart, 4 Wemyss Place,	1886
	Dr Henry Hay, 7 Brandon Street,	1884
95	Dr John Henderson, 7 John's Place, Leith,	1848
	Dr J. W. B. Hodsdon, 30 Walker Street,	1883
	Dr R. E. Horsley, 13 Great Stuart Street,	1886
	Dr George Hunter, Linlithgow,	1876
	Dr James A. Hunter, 18 Abercromby Place,	1851
100	Dr Husband, 28 Clarence Street,	1849
	Francis B. Imlach, Esq., 48 Queen Street,	1843
	Dr Archibald Inglis, 33 Albany Street,	1827
	Dr W. Wotherspoon Ireland, Prestonpans,	1883
	Dr James, 11 Albyn Place, *Secretary*,	1877
105	Dr W. Allan Jamieson, 26 Rutland Street,	1876
	Dr James Jamieson, 43 George Square,	1877
	Dr R. M'Kenzie Johnston, 5 Rutland Square,	1883
	Dr J. Carlyle Johnstone, Morningside Asylum,	1882
	Dr Kalley, 9 Tipperlinn Road,	1861
110	Dr Keiller, 21 Queen Street,	1845
	Dr Skene Keith, 2 North Charlotte Street,	1885
	Dr Thomas Keith, 2 North Charlotte Street,	1852
	Dr C. Kennedy, 25 Newington Road,	1886
	Dr George Kerr, 9 Great Stuart Street,	1885
115	Dr W. Scott Lang, 1 Leopold Place,	1886
	Dr Robert Lawson, 24 Mayfield Terrace,	1881
	Dr R. F. C. Leith, 107 Marchmont Road,	1886
	Dr George Leslie, Falkirk,	1881
	Dr Linton, 60 George Square,	1863
120	Dr Littlejohn, 24 Royal Circus,	1853
	Dr Lucas, Dalkeith,	1875
	Dr R. A. Lundie, 35 Warrender Park Road,	1883
	Dr P. M'Bride, 16 Chester Street,	1879
	Dr E. M'Callum, 3 Brandon Street,	1885
125	John M'Gibbon, Esq., 55 Queen Street,	1868
	Dr MacGillivray, 11 Rutland Street,	1877
	Dr G. Mackay, 2A Gilmore Place,	1878
	Dr G. H. Mackay, Elgin,	1885
	Professor Sir Douglas Maclagan, 28 Heriot Row,	1834
130	Dr P. H. Maclaren, 1 Drumsheugh Gardens,	1868
	Dr Roderick M'Laren, 23 Portland Square, Carlisle,	1882
	Dr William M'Neil, Stranraer,	1883
	Dr Donald MacRaild, Greenock,	1883
	Dr A. Matthew, Corstorphine,	1882
135	Dr D. Menzies, 21 Rutland Square,	1878
	Dr W. Menzies, 3 Lothian Road,	1847
	Dr J. Mill, 34 Summerside Street,	1886
	A. G. Miller, Esq., 11 Walker Street, *Treasurer*,	1867
	Dr D. Milligan, 7 West Maitland Street,	1885
140	Dr Arthur Mitchell, 34 Drummond Place,	1859
	Dr Moir, 52 Castle Street,	1836
	Dr Alexander Moir, 30 Buccleuch Place,	1876
	Dr J. Rutherford Morison, Hartlepool,	1882
	Dr John Mowat, 1 Hope Park Terrace,	1885
145	Dr Claud Muirhead, 30 Charlotte Square,	1866
	Dr R. Milne Murray, 10 Hope Street,	1884
	Dr A. D. Leith Napier, Dunbar,	1879
	Dr T. Goodall Nasmyth, Cowdenbeath, Fife,	1884
	Dr E. F. Neve, Cowgate Dispensary,	1884

		Date of Admission.
150	Dr H. Newcombe, 5 Dalrymple Crescent,	1883
	Dr P. Orphoot, 113 George Street,	1865
	Dr T. W. Pairman,	1884
	Dr Paterson, 15 Merchiston Park,	1847
	Dr D. Noël Paton, 21 Maitland Street,	1885
155	Dr Peddie, 15 Rutland Street,	1842
	Dr J. A. Philip, Italy,	1878
	Dr R. W. Philip, 12 Hope Street,	1883
	Dr Playfair, 25 Rutland Street,	1874
	Dr J. H. Pringle, 5 Livingstone Place,	1886
160	Dr S. Hall Puckle, 32 Morningside Road,	1885
	Dr Rattray, Portobello,	1874
	Dr William Richardson, Bath Lodge, Reading,	1884
	Dr James Ritchie, 14 Charlotte Square,	1873
	Dr R. Peel Ritchie, 1 Melville Crescent, *Vice-President*,	1862
165	Dr Argyll Robertson, 18 Charlotte Square,	1861
	Dr Ronaldson, 18 Bruntsfield Place,	1877
	Dr J. Maxwell Ross, 112 Gilmore Place,	1882
	Dr Joseph C. Ross, Penzance,	1884
	Dr William Russell, 46 Albany Street,	1884
170	Professor Rutherford, 14 Douglas Crescent,	1866
	Dr F. A. Saunders, Denburn, Crail,	1884
	Dr Thomas R. Scott, Musselburgh,	1884
	Dr Andrew Semple, 33 Queen Street,	1883
	Dr John Shand, 34 Albany Street,	1878
175	C. H. E. Sheaf, Esq.,	1871
	Dr W. H. Shirreff,	1883
	Dr J. Sibbald, 3 St Margaret's Road,	1859
	Professor Simpson, 52 Queen Street,	1859
	Dr A. J. Sinclair, 21 Northumberland Street,	1873
180	Dr A. T. Sloan, 22 Forth Street,	1885
	Dr Andrew Smart, 20 Charlotte Square,	1865
	Dr G. D. Smith, 146 Ferry Road,	1877
	Dr John Smith, 11 Wemyss Place,	1856
	Professor Grainger Stewart, 19 Charlotte Square, *President*,	1861
185	Dr J. S. Stewart, 16 Merchiston Terrace,	1885
	Dr W. Stewart, Kirkwall,	1879
	Dr John Strachan, Dollar,	1867
	Dr James Struthers, 39 Charlotte Street, Leith,	1849
	Dr Johnson Symington, 2 Greenhill Park,	1878
190	Dr W. Taylor, 12 Melville Street,	1871
	Dr C. H. Thatcher, 13 Albany Street,	1876
	Dr Alexander Thom, jr., Crieff,	1884
	Dr Alexander Thomson, 14 Rankeillor Street,	1849
	Dr J. Stitt Thomson, Dalkeith,	1877
195	Dr Francis Troup, 1 Minto Street,	1883
	Dr Batty Tuke, 20 Charlotte Square, *Vice-President*,	1864
	Dr J. Batty Tuke, jr., Balgreen, Murrayfield,	1886
	Professor Sir William Turner, 6 Eton Terrace,	1858
	Dr R. S. Turner, Keith,	1867
200	Dr Underhill, 8 Coates Crescent,	1872
	Dr T. Edgar Underhill, Tipton Green, Staffordshire,	1885
	B. C. Waller, Esq., M.B., Carnforth,	1877
	Dr P. H. Watson, 16 Charlotte Square,	1856
	Dr W. Watson, Midcalder,	1862
205	Dr A. D. Webster, 20 Newington Road,	1883
	Dr Graham Weir, 36 Heriot Row,	1843
	Dr David Wilson, 12 Dean Terrace,	1844
	J. L. Wilson, Esq., 44 South Clerk Street,	1883
	Dr T. D. Wilson, 10 Newington Road,	1880
210	Dr William Wilson, 21 Young Street,	1885
	Dr Oswald G. Wood, The Castle,	1886

		Date of Admission.
	Dr Russell E. Wood, 9 Darnaway Street,	1883
	Dr G. Sims Woodhead, 6 Marchhall Crescent,	1883
	Dr Strethill Wright, Southport,	1871
215	Dr Hamilton Wylie, 1 George Place,	1883
	Dr John Wyllie, 1 Melville Street,	1868
	Dr James Young, 14 Ainslie Place,	1859
	Dr P. A. Young, 25 Manor Place,	1870
	Dr Ziegler, 47 George Square,	1876

NON-RESIDENT.

220	Dr Lauchlan Aitken, *Rome*,	1868
	Dr F. W. Barry, *London*,	1878
	Dr Bethune, *Toronto*,	1861
	Dr J. W. Black, *London*,	1865
	Dr Brodie, *Canterbury*,	1865
225	Dr John Brown, *Burnley*,	1878
	Professor F. S. B. F. de Chaumont, *Netley*,	1876
	Professor Cleland, *Glasgow*,	1864
	Dr Coghill, *Ventnor*,	1870
	Dr P. M. Deas, *Exeter*,	1868
230	Dr J. W. Eastwood, *Darlington*,	1871
	Dr R. B. Finlay, M.P., *Middle Temple, London*,	1864
	Dr Foulis, *Cupar-Fife*,	1859
	Dr Fowler, *London*,	1847
	Professor Gamgee, *St-Leonards-on-Sea*,	1863
235	Peter Gordon, Esq., *Juniper Green*,	1861
	Dr A. Graham, R.N.,	1853
	Dr Groesbeck, *Cincinnati*,	1875
	Dr Archibald Hall, *Montreal*,	1853
	Professor D. J. Hamilton, *Aberdeen University*,	1876
240	Dr J. H. Hay, *Alloa*,	1880
	Dr Stanley Haynes, *Malvern*,	1864
	Dr J. S. Howden, *Montrose*,	1856
	Dr T. Inglis, *Lincoln*,	1878
	Dr James Johnston, *Shanghai*,	1871
245	Dr George Keith, *Currie*,	1845
	Dr Lowe, *Wimbledon*,	1845
	Dr F. R. Macdonald, *Inveraray*,	1860
	Dr K. N. Macdonald, *Cupar-Fife*,	1880
	Dr John A. Macdougall, *Carlisle*,	1875
250	Dr John Mackay, *Aberfeldy*,	1881
	Professor M'Kendrick, *Glasgow*,	1870
	Dr W. O. Mackenzie, D.I.G.H., *London*,	1845
	Dr T. J. Maclagan, *London*,	1875
	Dr J. Moolman, *Cape of Good Hope*,	1877
255	Dr J. Ivor Murray, *Scarboro'*,	1857
	Dr Andrew Myrtle, *Harrogate*,	1859
	Professor Bell Pettigrew, *St Andrews*,	1873
	Dr Phillippo, *Kingston, Jamaica*,	1860
	Professor W. S. Playfair, *London*,	1857
260	Dr Priestley, *London*,	1854
	Thomas Sheriff, Esq., *Edinburgh*,	1867
	Dr Sinclair, *London*,	1850
	Dr Francis Skae, *Lerwick*,	1864
	Dr T. Skinner, *London*,	1856
265	Dr John Smith,	1873
	Dr Van Someren, *Redhill, Surrey*,	1845
	Dr Somerville, *Galashiels*,	1877
	Dr Graham Steell, *Manchester*,	1877

		Date of Admission.
	Professor Stephenson, *Aberdeen*, ...	1861
270	Dr H. R. Storer, *Newport, Rhode Island, U.S.*, . .	1855
	Lawson Tait, Esq., *Birmingham*, ...	1870
	Dr Thin, *London*, ...	1861
	John Traill, Esq., *Arbroath*, ...	1853
	Dr Turnour, *Denbigh*, ...	1843
275	Dr W. Watson, *Montrose*, ...	1863
	Dr Walter Weir, *London*, ...	1879
	Dr Yellowlees, *Gartnavel Asylum, Glasgow*, . . .	1862
278	Professor John Young, *Glasgow*, ...	1860

N.B.—*Members are requested to communicate with the Secretaries if they discover any errors or omissions in the List, and also to intimate all changes in their addresses.*

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TRANSACTIONS

OF

THE MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH,

FOR SESSION LXV., 1885-86.

Meeting I.—November 4, 1885.

Dr H. D. Littlejohn, *President, in the Chair.*

I. Election of Office-Bearers.

The following gentlemen were appointed office-bearers for the ensuing session:—*President*, Prof. Grainger Stewart, M.D., F.R.C.P. Ed.; *Vice-Presidents*, J. Batty Tuke, M.D., F.R.C.P. Ed.; John Duncan, M.A., M.D., LL.D., F.R.C.S. Ed.; R. Peel Ritchie, M.D., F.R.C.P. Ed.; *Councillors*, A. M. T. Rattray, M.D., Portobello; A. Moir, L.R.C.P. and S. Ed.; Johnson Symington, M.D., F.R.C.S. Ed.; P. M'Bride, M.D., F.R.C.P. Ed.; John Smith, M.D., LL.D., F.R.C.S. Ed.; Henry D. Littlejohn, M.D., F.R.C.S. Ed.; Francis Troup, M.D., M.R.C.P. Ed.; James Allan Gray, M.D., F.R.C.P. Ed.; *Treasurer*, Alexander G. Miller, F.R.C.S. Ed.; *Secretaries*, Alexander James, M.D., F.R.C.P. Ed.; Charles W. Cathcart, M.B., F.R.C.S. Ed.; *Editor of Transactions*, Dr William Craig, M.D., F.R.C.S. Ed.

II. Election of Ordinary Members.

The following gentlemen were elected Ordinary Members of the Society:—David Milligan, M.B., C.M., Edinburgh; George Dods, M.D., Edinburgh.

III. Exhibition of Patients.

1. *Dr James Carmichael* exhibited a girl, aged 7, who had

suffered from NOMA. She was admitted into the Royal Hospital for Sick Children in an extremely feeble state on the 17th September, with the history that she had been a healthy child till six weeks previous to her admission, when she had an attack of typhoid fever, during recovery from which (three weeks before admission) she was attacked with gangrenous stomatitis. The mother stated that the left cheek became swollen, a bluish spot appearing in the centre of it. The swelling increased very rapidly, a fœtid discharge escaping from the mouth. A week before she was brought into hospital the slough separated. On admission she was pallid, much emaciated, and very feeble; pulse 120, small and compressible. The whole of the left cheek was destroyed from the angle of the mouth in front to nearly the angle of the lower jaw behind. The lower maxillary bone and the teeth were laid bare, necrosed, and black. The upper maxillary bone could also be felt bare and dead. The phagedenic action was apparently quite arrested, as the edges of the wound showed a healthy granulating surface all round. On the third day after admission, the lower jaw was snipped through at the symphysis by Mr Annandale, who kindly came to see her in consultation. The bone was thereafter easily disarticulated. On the 16th October Dr Carmichael, with equal ease, removed the upper maxilla which had become loosened from its attachments. After this the wound contracted with great rapidity, and now presented a round fistulous opening about the size of a shilling. It was not likely that this would close without a plastic operation. The case was interesting from the fact of the child's recovery. He, Dr Carmichael, was unable to refer to any statistics of this disease, but by far the larger proportion of the cases was fatal. Death sometimes took place within a week or less, but might be prolonged for ten or twelve days, the fatal result being due to exhaustion or the supervention of septicæmia, pneumonia, diarrhœa, or such like complication.

2. *Dr MacGillivray* showed a CHILD, aged 6, on whom he had performed OSTE-ECTOMY six weeks previously, for very aggravated talipes equino-varus. He said it would be remembered that he showed a similar case to the Society last year. In both cases the result had been eminently satisfactory, though in this instance the power of walking was not yet so good as in the former case, owing to the child having suffered from infantile paralysis, and having been attacked by erysipelas after the operation, on account of which the limb had to be kept at rest a much longer time than usual. Previous to this operation the child had been under treatment for more than a year, tenotomy and other methods of treatment having been tried without avail. The operation consisted in the removal of a wedge-shaped portion of bone from the tarsus, the base corresponding to the cuboid, the apex to the neck of the astragalus. The disadvantages of the operation were the shorten-

ing of the foot, and loss of the arch which resulted, the advantages being the perfect position and movement which were attained. The other alternatives were excision of the astragalus, amputation of the foot, or leaving it alone.

IV. Exhibition of Pathological Preparations.

1. *Dr James Carmichael* showed (*a.*) the NECROSED UPPER AND LOWER MAXILLARY BONES of the left side from his case of noma; (*b.*) a preparation of diseased MESENTERIC GLANDS and LARGE INTESTINE from a case of tabes mesenterica. The patient, a boy aged 10, was admitted into the Royal Hospital for Sick Children on the 25th of June, and died on the 8th of September. He was very much emaciated, and weighed only 39 lbs. He had only been dismissed from hospital a month before with suspected tuberculosis. There were, however, no physical signs of the disease in any of the organs. On readmission, evidences of disease in both lungs were found, and there was persistent diarrhœa. The stools soon became bloody and mixed with mucus and undigested food. The abdomen was not enlarged, but somewhat resistent, and clear on percussion, and there was no tumour of any kind, hardness, or swelling. The further progress of the case showed progressive emaciation, with persistent diarrhœa and the gradual formation of a hard glandular mass in the umbilical region. At the post-mortem examination an enormous mass of glands was found which were caseous and tubercular, and presented a typical example of the so-called tabes mesenterica, which was merely a local evidence of general tuberculosis, and not a primary or purely local abdominal affection, as students were so apt to suppose, from the fact that in text-books even yet a special chapter was devoted to this condition. The large intestine showed extensive ulcerative enteritis, which accounted for the intractable diarrhœa during life. The post-mortem examination further revealed small caseous masses in both lungs, but chiefly at the apex of the right lung. There were also numerous gelatinous tubercles in the pleura, diseased bronchial glands, waxy spleen and intestines.

2. *Dr Troup* showed a number of MICRO-PHOTOGRAPHS OF CERTAIN CONSTITUENTS OF SPUTUM IN DISEASE. Among them were the black spit of the collier, sputum of pneumonia, sputum containing fatty crystals and fragments of ultimate fibre of muscle, various forms of laryngeal and pulmonary elastic tissue, columnar and ciliated epithelium, so abundant in the disease called by Curschmann of Hamburg "Bronchiolitis exsudativa," and the spirals and Charcot crystals so common in this affection, and of which there appeared to be no mention in our medical literature. This bronchiolitis generally ran a chronic course, and had much in common with, and was frequently the cause of, secondary asthma

nervosum. What chiefly differentiated this disease from other pulmonary ones was the sputum. This was grayish-white or grayish-yellow, was extremely tenacious and frothy, retaining the froth for days on its surface; and when a particle of it was pressed between slide and cover-glass it almost creaked, and was so elastic as scarcely to spread out into a film. Its contents were curious, and seemingly unknown in this school, but were well known in Germany as the "Curschmann spirals." Those spirals, photographs of which were shown, were sometimes hollow, and had varicose air-containing dilatations; sometimes meandering, with many exquisite tortuosities, through the centre of their long axis was a central thread composed of an apparently homogeneous, glittering, highly refracting, almost phosphorescent substance, which was sometimes dark according to the focus. The locus nascendi of this central core was in the very terminal bronchioles, or partly in the alveolar passages, for occasional specimens were seen with infundibular mould at one end. Much looking at them had convinced him (Dr Troup) that the greater part of the core was composed of columnar and ciliated epithelium cemented by some fibrinous, glutinous material. A few of the cells got entangled by their long, curled, or hooked extremities; spindle and round cells from the deeper mucous layers added themselves; the nucleus thus formed growing by accretion of new matter, the thread got spun and twisted, and kinked in its small containing bronchiole very much as one saw a straw rope doubling and twisting in the process of its manufacture. Gradually it got shoved along and out of its parent tubule towards those of larger calibre, and during the journey acquired its outer covering of spirally arranged, round, and spindle cells. But the threads were not always thus embedded; very many lay naked, as was seen in the photographs, or in some part of their course the outer covering was deficient, exposing the bare central thread, and often they ended in a sheaf of fibres so very fine as to be almost invisible. In length the thread varied from 1000th of an inch to the magnificent specimen in the photograph. With a magnification of 300 or 400 the smallest zigzag examples seemed homogeneous, but an immersion lens revealed them made up of twisted columnar or ciliated cells, and it seemed reasonable to suppose, on the "ex pede Herculem" principle, that the larger ones were similarly agglomerated. However this might be, it was certain that an enormous desquamation of the ciliated and deeper layers of the bronchial mucous membrane took place in this disease, and the irritation causing such shedding must be very severe, for such epithelium was not common in expectoration, even a large amount of catarrhal swelling being inadequate to separate it in any quantity, such as is found in every specimen of the sputum now under consideration. Photographs of bronchitic casts were also shown to illustrate how different they were from the spirals. Of almost equal interest

was the presence of sometimes enormous quantities of Charcot-Leyden crystals. Curschmann supposed them to be "alters-produkte," age-products of the regressive metamorphosis of the round and spindle cells among which they lay. Dr Troup had photographs which seemed to show that they were also formed directly from the columnar epithelium, as transition stages between the two could be seen. The crystals were said to be long octohedra. All he had seen were fusiform, and frequently truncated at one end. Chloroform did not dissolve them. They resisted putrefaction for a long time, and showed no colours by polarized light. Leyden supposed those sharp crystals might cause the dyspnœa of bronchial asthma by irritating the peripheral ends of the vagus. Dr Troup had seen them abundant where there never had been any dyspnœal seizures, so this statement would not hold water. Spirals and crystals together seemed to cause a mechanical blocking of the lumen of the bronchioles, and then spasm of the bronchial muscle came on perhaps in an effort to get rid of the infarctions. The sudden transition from a feeling of wellbeing to the most urgent dyspnœa could only be explained in this way, as also the sometimes equally sudden return to quiet breathing without much expectoration, after chloral and subcutaneous use of morphia. Cases where spirals were present in quantity, without resultant asthmatic attacks, might be interpreted by supposing the diseased bronchial territory to be not very extensive, and the irritability of the diseased individual to be of small degree. Phthisis, closely simulated where there had been no asthmatic seizures, sometimes wound up such cases. He lately saw such an one where elastic tissue and bacilli of tubercle were seen in the (otherwise bronchiolitic) expectoration thirty years after the first attack of asthma.

3. *Dr MacGillivray* showed (*a.*) A HAND REMOVED FOR EPITHELIOMA. The patient was a woman aged 45, from Sutherlandshire. As a child, she received a burn on the back of the hand, the scar of which had continually undergone irritation from exposure in her outdoor work, and ultimately became epitheliomatous. All the hand, with the exception of the thumb, was amputated through the medio-carpal joint, a flap being obtained from the palm. (*b.*) ONE-HALF OF THE LOWER JAW, and THREE-QUARTERS OF THE TONGUE AND FLOOR OF THE MOUTH, successfully removed by Whitehead's method. (*c.*) A CRIMEAN BULLET removed from the internal condyle of the femur. The patient had been a sergeant in the Rifle Brigade during the Crimean war. One morning the man behind him let off his rifle while it was at the trail. The bullet smashed the stock of his rifle, and caused a wound of the popliteal space, the knee-joint being opened into; suppuration followed, the joint becoming ultimately osseously anchylosed. Years later other abscesses formed, and ultimately the late Sir William

Fergusson cut down upon the condyle and removed a portion of bone with several minute pieces of lead. This wound never healed, and as the patient's health was becoming undermined through the pain and constant discharge, he was ultimately, in the autumn of this year, sent down from London to be under Dr Heron Watson's care at the Chalmers Hospital, with a view to amputation. Before having recourse to this severe measure, Dr MacGillivray thought it best to cut down on the internal condyle, into the interior of which a sinus led; this having been enlarged by means of a brace and centre bit, the bullet was found and removed. The patient had made an excellent recovery, and had now returned to work.

4. *Dr Craig* showed a full-time fœtus presenting the rare malformation of a CYCLOPS. The nose or its representative appeared as a process from the forehead, and a single eye immediately underneath. There was a curious depression all round the surface of the head, and the brain was evidently very imperfectly developed. The left foot had an extra toe, and the left hand a rudimentary finger attached to the little finger. He intended to have the parts carefully examined, which could be done without injuring the face, and a full description would be presented afterwards.

5. *Dr Foulis* showed a MODIFIED CATHETER by which the bladder could be safely and effectually washed out, the patient himself doing it as easily as the surgeon. The essential parts were a sixpenny tin with a tap placed half an inch above the bottom of the vessel, so that a certain amount of liquid might always remain in it when being used. This tin contained an antiseptic fluid. The catheter had a projecting outlet half an inch from the orifice, by which it could be connected to the tap of the tin through an india-rubber tube. The catheter was first passed and the urine allowed to escape. Immediately it escaped the fluid was allowed to run from the tin into the bladder through the tube attached to the catheter by simply turning the tap. When the bladder was full the tube could be closed, and the finger removed from the orifice of the catheter allowed the fluid to run out as did the urine before it. The process could then be repeated. He thought it absolutely essential that whenever a catheter was introduced into the bladder it should not be removed till the bladder was washed out with an antiseptic solution, and this was specially necessary when the urine contained pus. He recommended this modified catheter because it was very simple in construction, very efficient, and very cheap.

V. VALEDICTORY ADDRESS.

By the retiring President, Henry D. Littlejohn, M.D., F.R.C.S. Ed., Lecturer on Medical Jurisprudence, Edinburgh School of Medicine, etc.

In selecting a topic for this valedictory address I naturally fall back on those departments of medicine with which I am most familiar, and in which I have worked during my professional life. I trust, therefore, the members of this Society will bear with me for a short time as I treat on some topics in Medical Jurisprudence and Public Health which have specially attracted my attention.

First, As to the Teaching of Medical Jurisprudence. It has often struck me with surprise that so few of the many lecturers on this important subject discharge the duties of Surgeon of Police, and thereby enable themselves to acquire a *practical* acquaintance with the many forms of violent death, not to speak of the opportunities afforded by that position of giving evidence in courts of law, and of becoming familiar with medico-legal questions of all kinds. It is therefore not to be wondered at that medical jurisprudence is not regarded with interest by the student while preparing to undergo his final trials, and that when he settles down in practice he, as a rule, eschews all cases which may necessitate his appearance in the witness-box. This indifference on the part of the student and practitioner helps to account for the general unsatisfactory nature of medical testimony on trials, and for the continuance of that distrust by the legal profession of medical opinion in a court of law.

The present system of teaching is, in my opinion, fundamentally wrong. The lecturer should be practically conversant with the subject matter of his lectures, and his prelections, instead of consisting of a digest of some of the more popular text-books, should be based on his own experience, and, in addition, the student should be brought face to face with the facts of the science in the presence of his teacher, who ought to have the opportunity of demonstrating them on the dead or living body. It is only thus that an intelligent interest can be excited in the student, to lead him to study the subject with practical zest. Facts, the knowledge of which he previously acquired in the course of his reading, now assume an importance and a definition which fix them on his memory in a manner which mere reading can never do. So that what is generally regarded by the student as one of the most unsatisfactory subjects of his medical studies becomes at once full of interest, and the lecture-room, instead of being a species of dreary prison-house, is converted into a place where the intelligent student feels he is

truly gaining knowledge, and that of a kind which is certain to be of use to him in all departments of his profession.

Where such a method of practical instruction is not available, the student has to trust for his examinations to his notes or to some text-book. Such a method of cramming accounts for the unsatisfactory nature of the examinations on this important subject of medical study. There is nothing more disheartening for an examiner than to have to question a candidate, for example, on the subject of Drowning, and to find that he has never had an opportunity afforded him of seeing a body which has been recovered from the water, and of having pointed out to him by his teacher the various changes incident to immersion in water. It is like examining a student on "Delivery of the Pregnant Female" who has never attended a case of confinement, and who trusts merely to his lecture-notes to enable him to answer the questions of his examiners. How useless it would be to question a student on the subject of Chest Disease who had never walked the wards of a hospital, and watched cases for himself under the eye of his teacher!

What I complain of is that, while due care has been taken to supply the other subjects of medical study with their practical departments, so to speak, no endeavour has been made by the Medical Council and the various licensing bodies to insist that medical jurisprudence should be similarly treated. Thus anatomy has its dissecting rooms; chemistry, physiology, and pathology their laboratories; medicine, surgery, and obstetrics, fully equipped hospitals and dispensaries—in all of which the student obtains practical instruction.

Unfortunately, owing to this want and other causes, medical jurisprudence in all our schools is comparatively neglected. Take any of the provincial or even metropolitan schools—medical jurisprudence is regarded with such indifference that it is generally selected as the subject supposed to be most easily taught, and it is usually assigned to the youngest and least experienced member of the teaching staff, although, as you all know, the subject matter of his lectures is drawn from every department of medical study. A case of poisoning, for example, can only be fully investigated by means of very varied knowledge. The *symptoms* must be contrasted with those of some disease suddenly established, constituting what is called the "differential diagnosis," by which the medical attendant, in circumstances of great difficulty, is enabled not only to refer the symptoms to some one class of poisons, but even possibly to a special poison, thereby enabling him to select at once the appropriate antidote, and thus save life. Should he be unsuccessful in this, and a *post-mortem* examination is ordered, he must be able to recognise and describe the appearances in the dead body with the skill of a pathologist; and, lastly,

he must aid the authorities in the further investigation of the case by removing those organs and fluids in which the chemist may most readily find traces of the poison.

Our universities are not much better off. With one or two brilliant exceptions, the occupants of the chairs of Forensic Medicine are never called upon to give evidence in a court of law or to conduct medico-legal inquiries. They have no opportunity of bringing under the notice of their classes those cases of sudden death, suicide, etc., etc., which, as you will observe, are of too common occurrence in all our towns. The nature of their prelections can easily be imagined, and with this, which I hold to be, imperfect knowledge, the student passes his final trials and enters on practice. The very first case which comes under his notice may demand from him some medico-legal knowledge and acquaintance with official forms with which he is totally unacquainted. The authorities are put to much inconvenience in consequence of this ignorance; and, in my experience, the facts of the case have too often been so imperfectly noted and reported that the ends of justice have been frustrated.

Now, the remedy I would suggest is this, that medical jurisprudence should be practically and intelligently taught, and this I hold can only be done by the lecturer having some official relation to our criminal authorities. In all our medical schools endeavours should be made to combine the teaching of the subject with the duties of such an office as the surgeoncy of police. It is the official who occupies that position that is summoned to see all cases demanding the cognizance of the police; and as he is generally the adviser of the criminal authorities, he is naturally called upon to make dissections and to conduct inquiries of all kinds relating to the subject-matter of his course of lectures; and he is thus, as I have said, enabled to preserve that *practical* tone in his prelections which is, in my opinion, absolutely necessary to give them any authority, and at the same time (a matter of some moment) to interest his jaded auditory; for we must remember that the medical student of to-day is over-lectured, and unless we can appeal practically to more senses than the ear, our tuition becomes comparatively valueless.

When I turn, *Secondly*, to Medico-Legal Practice, I approach a delicate topic, involving the relations between the criminal authorities and the profession. And yet I hold that, if we follow the guiding of the "Golden Rule," it is impossible that these relations can ever lead to misunderstanding and breaches of medical etiquette. The authorities have an undoubted right to avail themselves of the best skill and the most mature experience they can command. But the medical man selected ought to remember that in discharging the special duty to which he has been summoned, he has also a professional duty to discharge. Nothing can

be more galling for a practitioner than to find himself and his evidence disregarded in the investigation of an important criminal case, when he is conscious that he was the first summoned, and that thus he had the opportunity of observing facts of great importance. The ready answer of the public prosecutor is that he alone is responsible to the Crown for the proper investigation of crime, and that in the exercise of this responsibility he is bound, with a due regard to the public interest, to summon to his aid the best skill of the town or country. This is so far true; but as two medical men are required in an important case in our courts of law, I hold that it is essential that one of these should be the medical man who was first summoned, and who, in all probability, has been put to much inconvenience by being called by the police or the neighbours from other duties, and at an untimeous hour. But let the action of the authorities be what it may, as it is often difficult to get a layman, be he a lawyer or not, to sympathize with the unwritten law of medical etiquette, the duty of medical inspectors is plain,—it is at least courteously to afford the medical man who first saw the case an opportunity of being present at the dissection, and thereby to recognise his position and to lessen his mortification at being overlooked by the authorities. A circumstance has comparatively recently occurred which renders the caution I have just stated of increased importance.

It was for a long period made the subject of repeated complaint, that while in England the medical practitioner was paid the usual honorarium for the dissection, and also for his subsequent evidence at the inquest, in Scotland only one fee was paid for the dissection and for the written medical report, which is the equivalent to the *vivâ voce* testimony at the English inquest. Lord Advocate Watson, now Lord Watson, has the merit of recognising this discrepancy, and of influencing the Government of the day to raise the fee of a dissection and a medical report from £1, 1s. to £2, 2s. This was a tardy act of justice, but unfortunately it has been clogged with certain formalities which have prevented it being the boon it was expected to be to our profession. Every such increased fee must be made the subject of a separate account, which is made out by the local procurator-fiscal, sent to the Crown office, and there receives the official signature of the Lord Advocate or Solicitor-General. All this involves trouble to a set of already hard-worked, and in many cases underpaid, highly responsible officials. The result may easily be imagined. A dissection is now ordered with a certain amount of difficulty and increased caution; and what is, in my opinion, more detrimental to the profession and to the public interest, in order apparently to lessen the amount of the increased expense of the augmented fee to the country, the dissection is now, for the first time, generally intrusted to a single medical man. Now, with all my experience, extending over a long series of years, I must protest against this copying of

the reprehensible practice which too often obtains in England, viz., that in important medico-legal investigations respecting serious and mortal crimes, the testimony of only one medical witness is produced on the trial. Not only is such a course fitted to imperil the prosecution of crime, but it also adds greatly to the difficulties of the prisoner. Is it fair, is it proper, that a prisoner's life should depend on the unsupported evidence of a single professional witness, however eminent that witness may be? If the law of commonsense demands that all important facts in the preliminary investigation of crime should be spoken to by two witnesses, it is certainly equally important that those facts connected with the post-mortem examination should be satisfactorily proved by the evidence of two trustworthy medical men. As an adviser of the Crown, I certainly shrink from the sole conduct of these delicate and important investigations; and I have to reiterate what I have often stated, that the most experienced expert has the greatest personal satisfaction and comfort when associated with another medical man, who, although possibly comparatively inexperienced, fulfils the important function of corroborating his testimony and of speaking conclusively to the existence of possibly crucial injuries, which may either prove the guilt of the prisoner at the bar, or else free him from a capital charge.

It is the duty of the profession—certainly it is, in my opinion, of this Society—respectfully to remonstrate with the action of the criminal authorities in this matter, and to urge upon them the necessity of employing two medical men in the investigation of all important crimes involving the life or honour of a fellow-citizen.

I now turn shortly to the discussion of one or two topics connected with PUBLIC HEALTH.

WEEKLY HEALTH REPORTS.

In the *first* place, I hold it to be one of the principal duties of the health-officer to furnish to the public, through the medium of the press, a weekly statement of the health of the community to which he is attached. It is a matter of never-ending surprise to me that the great metropolis and other centres of population should not be provided with such a statement. Somewhere about Wednesday in the week a statement is furnished; but this is generally limited to a simple notice of the rate of mortality. This conveys little or no information that can interest the public or the profession; and I have always held that it is desirable that more facts should be supplied. For more than twenty years the citizens of Edinburgh have been furnished on Monday mornings not merely with the total mortality of the preceding week, and the calculated death-rate, but also with the respective mortalities of the chief divisions of the city, the inhabitants being thus

supplied with important information as to the health of the districts in which they live. Why cannot similar information be afforded to the citizens of London and other large towns? What use can it be to the inhabitants of any of the districts of London to be informed on Wednesday of the total death-rate of a population consisting of four millions? The post-office authorities, in order to facilitate the mere delivery of letters, has subdivided London into numerous districts. Why cannot the Registrar-General for sanitary or statistical purposes not make a less elaborate division, and every Monday morning let the inhabitants of important districts, such as, *e.g.*, Kensington, know the death-rate of the surrounding population? It is a trite remark, that stale information is uninteresting and comparatively valueless; and it is not to be wondered at that citizens, when treated to statistics in many cases a fortnight old, give little heed to them, and are thus led to regard with indifference questions relating to public health. What can be of more importance to a citizen than the sanitary state of his surroundings? These directly influence the death-rate and the causes of death,—a statement of which, therefore, will surely be regarded by the householder with, at any rate, equal interest to a statement of the weekly variations of stocks. It certainly may be urged on the score of economy, that notwithstanding his army of clerks, it is less the duty of the Registrar-General to furnish this information than the various local health-officers. Were each of these officials to undertake the duty as it is done in Edinburgh, it could easily be accomplished by such division of labour; with this attendant good, that the health-officer, in tabulating weekly the causes and the localities of death, gets a grip, so to speak, of his special duties, and observes for himself, and not at second-hand, what areas more especially demand his inspection. But what is the actual state of matters in the metropolis? Elaborate information is annually afforded by each health-officer in a voluminous report which, like similar documents, is too generally regarded as waste paper, and treated accordingly. Lastly, one great advantage of the plan followed in this northern metropolis of distributing the mortality—the *causes of death*, the *ages at death*, and specially the *zymotic mortality*—is, that each citizen is thus enabled to observe for himself the state of prevailing diseases, and to obtain information, should he desire it, as to the steps taken by the authorities to meet any special emergency.

I append a copy of the previous week's Return, which will illustrate the remarks I have made. These returns, I know, are eagerly scanned by the citizens, and since their first publication there has been, so to speak, a gradual education of the ratepayers in sanitary statistics which has assisted the authorities in carrying out their measures for improving the health of the city.

EDINBURGH.

HEALTH OF THE CITY.

Deaths for week ended 31st October 1885, ... 75
Country deaths to be deducted, . . 7

68

[Equivalent to an annual mortality of 14 per 1000.]

Mortality below weekly average of last year, . . . 19
Mortality of four preceding weeks, ... 67, 59, 76, 78
Mortality of corresponding week of last year, . . . 84

	Estimated pop. in 1884-85.	Males.	Females.	Total.
New Town, . .	94,644	14	11	25
Old Town, . . .	112,626	17	17	34
Southern Suburbs, .	43,345	5	4	9
Total, . .	250,615	36	32	68

MORTALITY AS TO AGE.

Under 1 Week, . . .	2	5 and under 15 years, . .	2
„ 1 Month, . . .	1	15 „ „ 30 „ . .	8
„ 1 Year, . . .	5	30 „ „ 60 „ . .	25
	— 8	60 „ „ 80 „ . .	12
1 and under 5 years, . .	9	80 „ „ 90 „ . .	4
		Above 90 years, . .	0

MORTALITY AS TO DISEASE.

Brain, ...	13	Croup, ...	0
Heart, ...	5	Abdomen, ...	10
Chest, ...	14	Diarrhœa, ...	2
Phthisis, ...	11	Debility and age, . . .	5
		Other causes, .	2

ZYMOTIC DISEASES.

	Mortality.				Cases Intimated.			
	New Town.	Old Town.	South Suburbs.	Total.	New Town.	Old Town.	South Suburbs.	Total.
Typhus.....	...	...	...	...	1	17	...	18
Typhoid	...	...	...	...	8	5	5	18
Diphtheria.....	1	1	...	2	4	2	3	9
Smallpox.....	...	...	...	...	...	...	...	..
Scarlatina.....	...	1	...	1	18	9	5	32
Measles.....	...	...	...	...	2	1	...	3
Hooping-Cough..	...	2	...	2	...	...	...	...
Erysipelas.....	...	...	1	1	...	...	...	...
Total.....	1	4	1	6	33	34	13	80

Note.—In terms of the Police Act, cases of Hooping-cough and Erysipelas are not intimated.

BIRTHS FOR THE WEEK.

Males.	Females.	Total.	Legitimate.	Illegitimate.
70	82	152	135	17

Reported by Medical Officer of Health,

HENRY D. LITTLEJOHN, M.D.

Notification of Infectious Diseases.

Second, Since November 1879, in addition to the weekly statement of the mortality of the city, the amount of cases of the more important forms of infectious disease has also been tabulated; and for this we are indebted primarily to the courtesy of the profession, and, secondly, to the enlightened liberality of our Town Council. The following statistics will, I have no doubt, interest my audience. Since November 1879 the total number of intimations of cases of infectious disease sent in by the medical practitioners of Edinburgh and the surrounding districts, up to the present date, amounts to 29,000; and the sum disbursed by the Town Council to the profession for this valuable information amounts to nearly £4000.

"EDINBURGH MUNICIPAL AND POLICE ACT, 1879."

TABLE OF INTIMATIONS OF INFECTIOUS DISEASE during the Undermentioned Years.

Disease.	1879.	1880.	1881.	1882.	1883.	1884.	Nov. 1885.	Total.
Fever, Typhus.....	6	18	23	45	50	42	48	232
Do. Typhoid ...	33	336	413	639	346	591	531	2,889
Diphtheria	17	172	171	217	214	183	123	1,097
Smallpox.....	1	5	4	1	0	1	5	17
Scarlatina.....	206	1897	1904	2111	1817	1423	915	10,273
Measles.....	123	3216	691	4050	2984	2476	937	14,477
Total.....	386	5644	3206	7063	5411	4716	2559	28,985
Cases removed to Hospital..... ...	35	323	396	539	514	720	568	3095

ZYMOTIC MORTALITY during the Undermentioned Years.

Years the Act has been in force.						
1879.	1880.	1881.	1882.	1883.	1884.	Average Death-rate.
8·48	17·15	13·20	9·90	10·43	12 24	11·90
General death-rate for same period, 19·04 per 1000.						

Corresponding Six Years.						
1869.	1870.	1871.	1872.	1873.	1874.	Average Death-rate.
16·55	11·50	22·88	28·08	11·08	14·21	17·38
General death-rate for same period, 25·55 per 1000.						

In no city in the world has the system of notification had a fairer trial or been more successful. The first result of the system was to open the eyes of the citizens and of the profession to the enormous amount of preventible disease that lay simmering in our midst, the existence of which was only too tardily and partially revealed by the mortality returns; and, second, to convince our

Town Council of the utter insufficiency of the accommodation provided in Edinburgh for the isolation and treatment of infectious disease. This led to instant action on the part of the authorities; and at an expense of fully £30,000, Edinburgh is now provided with a satisfactory infectious hospital, which will be available as an important adjunct to our Medical School, by affording our students and young practitioners an opportunity of studying, under favourable circumstances, those important diseases,—the treatment of which constitutes, as we all know, such a large part of ordinary medical practice.

Again, it cannot be doubted that this weekly statement of the number of cases of infectious diseases in the three leading divisions of our city must be of interest and value to the medical practitioner. His attention is thus pointedly directed to the leading forms of zymotic disease in our midst and their relative prevalence; and he is thus enabled, in many cases, to make a more rapid and trustworthy diagnosis.

But other and equally important advantages have attended the introduction of the notification of these diseases. In intimating them, as I have been repeatedly informed by my medical brethren, the profession as a body has been reminded of its duty to society in preventing, as far as possible, the spread of the disease by suitable isolation, and by taking every step that science has suggested for removing those conditions that favour its propagation. It is gratifying to observe that year by year the number of calls made on the municipal authorities to convey cases to hospital has increased; and it is to be hoped that, with the ample accommodation now afforded, every suitable case will be isolated in our hospital wards. Equally gratifying results have attended the notification in the marked attention now paid by the profession to the sanitary conditions in which the patients live. I have again and again been told that the mere filling up of the intimation card has led the practitioner to reflect on the surroundings of his patient, and to call on the authorities to remedy sanitary defects which otherwise might, in the hurry of practice, have been overlooked and never remedied, until such a mortality, or such an amount of illness was caused that summary remedy was imperatively called for.

This system of notification has been attended with such marked success, mainly by the cordial assistance afforded by my professional brethren; and also, it must be allowed, in consequence of the recognition, inadequate though it may appear, by the municipality of the value of their services. It was my duty, as the medical adviser of the corporation, to insist upon some recognition, and I am bound to state that my representations were at once given effect to; and so important has the system of notification appeared to the municipality, and so necessary for the maintenance of the reputation of our city as one of the healthiest in

the country, that the medical grant has always been most cheerfully paid by the ratepayers, and no grumble has ever been made, even in these, for all classes of society, economizing and unpropitious times. This is a sufficient answer to those of our English and Scotch brethren who, failing to recognise the importance of early intimation of infectious disease, and refusing to avail themselves of our northern experience, obstinately shut their eyes to the advantages of this important measure. Since the system was boldly inaugurated in Edinburgh, all the evils that were prophesied by gentlemen, regarded as leading authorities in sanitary science, have by our experience been proved to be groundless; and my presence here in the distinguished position of your President and the influential audience I have the honour to address, conclusively prove that notification of infectious disease is no sham, but an accomplished fact; and that it can be carried out in a large city and in the midst of a powerful Medical School, without the slightest infringement of medical etiquette, and in such a manner as to secure the cordial co-operation of every member of our profession.

Smallpox and Smallpox Hospitals.

Without some such measure of notification it is utterly impossible, in my opinion, to cope successfully with infectious disease. Were it generally adopted, the country would have been saved the danger and the scandal of a chronic epidemic of smallpox in London, and of this and other diseases in other large towns. But the important lesson we have learnt in Edinburgh must not be forgotten, viz., that along with a system of notification there must be ample means for suitable isolation. Unless these be combined, little effect will be exercised on the spread of these diseases; and the whole history of the present discussion as to vaccination and smallpox goes to show that, in order to stamp out that disease, notification and revaccination are required, and, in addition, the speedy isolation of every suitable case in a well-appointed hospital. The mention of this loathsome disease reminds me that our experience in Edinburgh of the benefits attending suitable isolation has been strangely overlooked in the interminable discussions, in the southern medical journals, as to the danger incident to smallpox hospitals. Here in 1871 we were visited with a severe outbreak of smallpox, and advantage was taken by the municipal authorities of Watson's Hospital — the well-known educational institution which occupied the site of our present Royal Infirmary —and in the course of a few days upwards of 300 cases were under treatment. The circumstances were interesting in a sanitary point of view. The building had to be improvised as a hospital; and owing to the operations of reconstruction having been begun, the enclosing walls and railings were imperfect, and

permitted of free access to the building on all sides. The inhabitants in the immediate neighbourhood were naturally alarmed. Another large school—Heriot's Hospital—was separated only by a thoroughfare from this smallpox hospital; almost as near we had George Square, inhabited by highly respectable citizens; and, as I have mentioned, a busy thoroughfare formed the northern boundary, while to the south there was a favourite walking resort of the inhabitants. A more crucial test to determine the distance to which the germs of smallpox could be carried through the atmosphere can hardly be imagined; and yet in not a single case was the disease propagated from the hospital to the neighbouring houses. Not a whisper of a suspicion was ever heard that this hospital acted as a centre of infection to any portion of the citizens. Its neighbourhood enjoyed an unusual immunity from the disease; and as the ratepayers were on the alert, and Edinburgh has an active local press, in which the citizens find ample space to ventilate their grievances, I am sure you will agree with me that had any case been traceable to proximity to the hospital, the public and the authorities would have quickly heard of it. This remarkable immunity was dwelt on by the late Sir R. Christison at the last meeting of the Social Science Congress at Edinburgh. It was effected by a very simple arrangement. The hospital was regarded as an infected and highly dangerous place, and was, therefore, subjected to a rigorous but easily arranged system of quarantine. The assistance of the police was obtained, and a special set of officers—both in uniform and as detectives—was told off to watch the building by night and by day. Our daily experience showed us how easily, under ordinary precautions, smallpox hospitals become centres of infection to the neighbourhoods in which they are placed. The anxiety of convalescents to communicate with the outside world, the determination of relatives and friends to maintain correspondence with patients and nurses are such, that special means of prevention must be employed. This, as our experience showed, can only be satisfactorily accomplished with the assistance of the police. An argument, were one required, to show the importance of amicable relations subsisting between the sanitary and police authorities; generally these are of a highly strained character, as I have often observed in the course of my official inspections in other districts, and leading to a direct conflict of officials who should act in concert instead of opposing the public interest. The late Dr Letheby complained to me of this antagonism in his own district in London. I am convinced that the only solution of the problem is to conjoin the offices of medical officer of health and surgeon of police in one person,—a junction which would not only furnish the health-officer with a large number of assistants—the entire police force—but by the consequent increase of his salary, would enable him to discharge the delicate duties of his office untrammelled with the cares of practice.

This I hold to be essential. All medical officers of health should be relieved from private practice. And nothing would bring about this desirable consummation sooner than the adoption throughout the length and breadth of the land of a system of notification of infectious diseases. No member of our profession can allow with any equanimity the house of his patient, and possibly his patient himself, to be visited by a rival practitioner, who, let him act with the greatest prudence, must at times give rise to suspicion, and who may find to his annoyance that some simple phrase or act has been so misrepresented as to give grave offence to his fellow-practitioner. The remedy for such a danger is, as I have said, the introduction of a general system of notification in Scotland, which would at once elicit from the profession such a decided expression of opinion as would compel local authorities to relieve their health-officer from the cares of practice; and by the judicious combination of districts, would secure for these officials a suitable compensatory salary. An additional check against sanitary officiousness is the phrase which has been introduced by our municipal authorities into our intimation card, putting it in the power of every practitioner to solicit or to retard the action of the sanitary authorities. The phrase "No immediate attention is required," if allowed to remain, informs the authorities that no necessity exists for their interference at that juncture; while if the word "No" is deleted, then action is at once invited.

This is represented by the opponents of the system as an abnegation of the powers of the sanitary authorities, and as placing them and their officials too much at the beck and call of the medical profession. Instead of regarding this, gentlemen, as any objection, I look upon it as one of the strongest arguments in favour of our method. The sanitary authorities must not attempt to override the profession. I hold strongly the opinion that every medical man, by assuming such an official position as health-officer, surrenders, so to speak, his individual liberty, and becomes a servant of the general public, and, I need hardly add, of his professional brethren. I regard it as no indignity to be informed by the youngest member of the medical profession of the existence of a nuisance, and to be called upon by him to remove it. I certainly do not consider it necessary to visit the house of a patient when it has been certified to me by a qualified medical man, that satisfactory steps have been taken to isolate the patient, and to prevent the spread of the disease. To act otherwise would be, in my opinion, to provoke conflict with my professional brethren, which would certainly end, in such an enlightened centre of medical science, in my dismissal, and, what would be worse, the discredit of sanitary science.

In country districts, where the existing medical practitioner has no local medical opinion to back him up, such intrusion as I have referred to is intolerable, and has, in my official experience, led to

the serious detriment of the public health from the refusal of medical men to afford information to an official who had given them just grounds of offence.

Uncertified Deaths.

Lastly, gentlemen, I have but one other topic with which I venture to trespass for a few minutes on your patience, and this has reference to statistics, and specially the statistics of "Uncertified Deaths." By these I mean cases of fatal illness in which no medical man has been summoned. I hold very strongly that every such uncertified death should be made the subject of special investigation. On inquiry it is found that Scottish towns generally show a large percentage of these deaths. In Edinburgh last year, on the other hand, no uncertified death was recorded in the various registers of our city. Acting on the principle I have just mentioned, whenever a party comes to register such a death at any of our local offices, he is at once referred to the police authorities, and I am called on to visit and report. Should the case be one, *e.g.*, of old age or long-standing illness, which has not necessitated the regular attendance of some medical man, and where sudden death has occurred, I feel myself justified, after due inquiry, and in some cases after a partial post-mortem examination, in certifying the cause of death as apparently due to old age, or otherwise, as the case may be. On the other hand, should the case present elements of uncertainty, the assistance of the police is at once invoked, and a report of the circumstances is drawn up and submitted to the public prosecutor. On that official is now thrown the onus of determining what future action is to be taken. Citizens, especially among the lower orders, too often show a carelessness and dilatoriness in summoning medical aid in the case of sudden illness; and with the terrible temptation suggested by our burial clubs and societies, the fear must be expressed that a too easy explanation may be given of a large number of these uncertified deaths among young children. These are always carefully examined into here by the police; in many cases, if no prosecution follows, the relatives are duly warned of the risk they have undergone, and generally they have been subjected to such a considerable amount of trouble and delay as to teach them the wholesome lesson not to neglect in any future case to avail themselves of the many sources of medical assistance afforded in our city.

And now, gentlemen, in conclusion, I have the satisfaction of handing over to my successor in this Chair, to be appointed at this meeting, the Presidency of a Society which is in a highly flourishing condition. The secretaries assure me that during the two years I have held office no fewer than fifty-four members have joined the Society, a larger number than in any previous two years of its history. Much of this success has doubtless been

owing to the high-class character of the papers read, and to the generally interesting nature of our meetings; but much also is due to the officials, including my Council and the Secretaries, Treasurer, and Editor, to all of whom I beg thus publicly to tender my acknowledgments. Our time-honoured Society has, so to speak, taken a new lease of life. It supplies a want in our great Medical School; and when I look at the roll of our members, comprising the *élite* of our profession, and especially those younger men who have already given high promise of increasing the reputation of Edinburgh as a scientific centre of medical education, I have no fear of its continued prosperity. Gentlemen, I thank you for the honour you did me in electing me to this Chair, and for the kindness with which you have listened to my parting words.

On the motion of *Dr Argyll Robertson* a hearty vote of thanks was awarded to the President for his able and instructive address, and for his conduct in the chair during the last two sessions.

Meeting II.—November 18, 1885.

Professor GRAINGER STEWART, *President, in the Chair.*

I. ELECTION OF NEW MEMBER.

J. Murdoch Brown, M.B., C.M., was elected an ordinary member of the Society.

II. ADDRESS.

The President called upon Surgeon-Major G. H. J. Evatt, M.D., of the Army Medical Staff, to address the Society on "THE MEDICAL ARRANGEMENTS OF AN ENGLISH ARMY CORPS IN WAR, WITH SUGGESTIONS AS TO VOLUNTEER HELP."

Dr Evatt said he proposed to explain, in a very simple manner, the system by which Private Thomas Atkins when struck down by a bullet, say at Abu Klea, was cared for, transported to the rear, and thence to London or Edinburgh, as the case might be, and to show the various medical units and organizations through which he must pass. The medical system that now existed provided for this duty in a very complete way. It was not so in the past. The change that had been undergone was one that was of interest to civil and military men alike. He could not regard the question as a purely military one. It was essential that their professional brethren in civil life should be acquainted with the working details of army medical organization, and that they should especially know the weak points in it, if there were any. The reason for

this was that public opinion was wanted to carry any public reform, and public opinion on questions relating to the position of the army medical officer and his means of work could only be formed by their brethren in civil life. There were few civil doctors who were able to give them any help in their struggle for progress. Their views were not very clear about regimental bearers, the bearer companies, the field hospitals, and other important items of army organization. They could not appeal to the ordinary soldier, who had little knowledge of medical requirements, and therefore it was their duty, if possible, to educate their civil brethren. In the sheets that were distributed they would find a plan of the ambulance arrangements of an English army corps. When an English army took the field, everything was arranged on the army corps scale. The corps consisted of 36,000 men, and the quantity of artillery, cavalry, transport waggons, etc., were drawn up on that scale. The component parts of the corps consisted of three divisions, a cavalry brigade, and the "corps troops," chiefly artillery and engineers. In each division there were twelve military units—six battalions of infantry forming two brigades, one battalion of rifles, three batteries of artillery, and one company of sappers to prepare roads and do pontoon work. The corps was medically controlled by a surgeon-general, the division by a deputy-surgeon-general, and the cavalry brigade by a brigade-surgeon. Supposing, then, a bullet struck Private Thomas Atkins, of the first division, a thousand miles up the Nile, how did he come back to the Guards' Hospital in London. If they referred to the plan, they would see how this was done. When the army was mobilized, the battalion, which in time of peace consisted of about 400 men, was raised to a war footing, and to it was posted a surgeon ranking with a captain from the medical staff. This officer could, however, do very little in the field if he had not with him some trained assistants. Under the old system the bandsmen were used to do this in a rough way, but since the German awakening a number of men from the regiments were taken and specially trained to give first aid and to properly carry a wounded man off the field. These men were seen in most of the volunteer regiments of the present day. They belonged to the battalion, wore the regimental dress, and were known as the regimental bearers. They were not in any sense a medical unit. They formed the "regimental ambulance detachment," and went with the battalion surgeon, picking up the wounded, giving the first dressing, and carrying them off the ground. These men were allowed to every regiment of infantry; but so far as he knew (but he spoke under correction) there was no provision among the cavalry or companies of sappers, etc., for giving first aid to a wounded man. The number of men allowed for this first aid was two men from each company. They were equipped with stretchers and surgical haversacks. The surgeon himself saw the cases picked up, and when necessary had

them sent on to the rear by his regimental bearers. What was done with them here? In the volunteer army there was no organization to take charge of the wounded soldier carried off the field. The volunteers were in the same position, so far as the giving of proper attention to the wounded was concerned, as were the regulars at the Alma. Since then the English army had adopted the organization which had proved so valuable in the German army in its late wars. This was the Divisional Bearer Company. This company formed a unit in itself, and two were attached to each division and served under the general and principal medical officer of the division. One such company was attached to the cavalry brigade, and one to the corps troops. He claimed for these units that, if not perfect, they were at least the germs of the best unit ever yet devised by medical skill in the army. Each company was officered by surgeons who had full command, and were manned by men of the Army Medical Staff. For some time after their formation, so averse were the authorities to giving a command to the medical men, they were officered by captains and lieutenants of orderlies—men who were usually promoted from the ranks for efficiency. Sir William Muir, however, had brought about a much-needed reform by getting the command handed over to the medical officers. The lay officers of the companies now acted as quarter-masters. Each company was furnished with surgery and ambulance waggons, and water-carts. Each surgery waggon contained an operating tent and table, dressings, cooking utensils, and medical comforts. The bearer company then formed a highly mobile hospital moved up to within range of fire. It moved directly in the rear of the fighting line, and having pitched the operating tent and dressing station, and left a suitable staff to assist there, they sent forward the waggons to a "collecting station" further ahead. Here they received the wounded from the regimental bearers, and co-operated with them by sending on the stretcher-bearers of the company, who went on to the actual battle-field to give first aid and pick up the wounded that could not be attended to by the regimental bearers. At the collecting station the wounded were put into the ambulance waggons, and thence taken to the dressing station, where a more careful examination was made than could be done on the field, operations performed, and other necessary assistance given. The bearer company could not, however, stop here long. The army might have orders to march forward, and the company must march also to give assistance to other sick and wounded men. This made it necessary to have some place still further in the rear for the reception of those who had been attended to in the first instance at the dressing station. This was supplied by the field hospital, and the army in front was disencumbered of the wounded—a most important matter. Had such a provision existed for the care of these men at the Alma, our army might have pushed forward, entered Sebastopol with the

Russians, and there and then closed the war. As it was, forty-eight hours were lost because of the defective arrangements under which the wounded had to be embarked. There were four of these field hospitals to each division. Others called stationary hospitals were placed along the lines of communications. The line in the plan was represented as winding simply to save paper. He thought it necessary to mention this, as on one occasion, when explaining the plan to the men of the Medical Staff, and afterwards examining them, he was rather surprised to be told by one of them that the road was made a winding one in order that the wounded might have plenty of air on the march. These field hospitals were made to afford medical aid to 100 men. Each was in charge of four medical officers—one in command, one quarter-master who acted as store-keeper and also as paymaster under the medical officer. Under these officers were (by the arrangements of this year) two ward-masters, four storekeepers, two compounders, fourteen nursing orderlies, three cooks, one clerk, one messenger, two washermen, and five supernumeraries, five officers, and thirty-four men. The washermen were introduced into the personnel of an English field hospital for the first time this year. Previous to this no distinct responsibility for washing the clothes of the sick rested on the medical service. It was mixed up with the duties of the Commissariat, and much confusion existed at Ismailia on this head. The medical service was now responsible for this work in war time. There was no use talking of antiseptic surgery in war, unless they had the first and most requisite condition—a thorough cleanliness in the hospital. The five supernumeraries were necessary to act as watermen, as sewagemen, and so forth. It must be remembered that these field hospitals did not have the ordinary sanitary appliances that were found in all peace hospitals. The water was not brought in by pipes, nor the sewage carried away by drains; hence men were needed for this special work. Behind the field hospitals were the stationary hospitals on the line of communications. There were eight of these, each accommodating 200 men, allowed to the army corps. The field hospitals might be ordered to empty their sick and wounded, in order to march on behind the army and receive other sick and hurt. The watchword of medical organization in the army at present was, "Free the front of wounded men." These wounded were then brought by waggons or by trains to the stationary and base hospitals. On the Continent this was done by means of those ambulance trains which had been so skilfully devised by Baron Mundy for the Austro-Bohemian branch of the Maltese Knights. In England there were no such trains, so that waggons would have to be employed. They would have to use in each country the means of transport afforded them. Now, if they contrasted the regulations of 1882 for such an hospital with those of 1885 for a field hospital of 100 men, they would see that a great advance had been made. For such an hospital,

intended to cover 200 men, only 37 orderlies were allowed. For half that number 34 were now allowed. This was the result of the investigation made by Lord Morley's committee into the charges made against the medical department after the campaign in Egypt in 1882. The field and stationary hospitals of these past days were singularly defective in personnel; but as soon as public opinion was roused, the defect was supplied. There were no washermen, no sewagemen, and no messengers; but they had them all now. The result was shown in the success of the medical staff in the Soudan. The doctors had not changed in themselves, but the work was done more efficiently because they were better equipped. A distinct step forward in army organization had been made in that way. These field hospitals were not, however, tried in time of peace as they ought to be. One was pitched at Aldershot now and then for the training of the young surgeons, but there was no permanent unit of a field hospital kept for any English doctor to go and see in working order. It would be a great advantage to have such a permanent unit kept, with its horse, waggons, and other equipment. It could be tested every morning on parade, and its weak points discovered; and so it would be in an efficient state if called upon for war service. It was at least as important that the field hospital should be able to do its work properly as it was that a battery of horse artillery should be in constant readiness for service, and no one would think of leaving the battery untried till war was declared. Many army surgeons did not know anything of the equipment of a field hospital except from their books. A major of horse artillery would be considered rather incompetent who had nothing but book knowledge. They wanted to be put on the same footing as the rest of the army. Was not that a fair demand? They were not, however, likely to have their demands granted unless they were backed up by public opinion. This was an important matter, because unless their wounded were efficiently cared for, they were likely to come back from the war with a broken down morale; but the wounded men, who suffered most, would not come back at all. The number that did not come back from the Crimea was 18,000 men. The wounded passed along the line of communications till they reached the great receiver—the base hospital. A historic base hospital they had in Scutari. It had doctors of skill, but they could not give an order. There was plenty of science, but no soup. There was no medical staff corps, and of course there was chaos. The officer who would work such an hospital, consisting perhaps of 500 patients, was a perfect type of an army surgeon. He might get a telegram from the front at any moment, saying a battle was fought, and ordering him to be ready to receive 100 wounded men in two hours. He must do it. He must have 100 beds ready at the proper time for these men. If his beds were all filled, he must transport patients to the ship hospital to make room for those

coming in. He must have a very good overflow system and a highly efficient body of men at his command.

They now came to the last link in the chain—the hospital ship. If Baron Mundy had produced the best ambulance trains, the English people had produced the best hospital ships in the world. During the present year Brigade-Surgeon Gribbon had brought home in a P. & O. ship, the "Ganges," some hundreds of invalids most successfully. They had every medical comfort on the voyage. Since then a Crimean medical officer had told him that it was one of his duties to take home a number of wounded from the Crimea, and his whole medical paraphernalia consisted of one ball of opium. From the hospital ships the wounded were landed, and sent to one or other of the great military hospitals in England. The chain was now complete. It could not, however, be said that there was not room for improvement. He should like to ask the question whether in war time, with the battalion raised to its war footing, 1000 men, one surgeon was sufficient for its needs at the front? In foreign armies every battalion had two doctors in war time, and in the German army there was in addition a surgeon attached to the officer in command of every three battalions to act as his sanitary adviser. In Britain, however, they were weak in numbers, and it might be that two men could not be spared at this point. In reference to the strength of the bearer company it was an interesting question—Whether one surgeon was sufficient with a party of eight stretcher-bearers? What time would it take a surgeon to attend to eight wounded men lying on stretchers? There ought to be another doctor with the stretcher party. Then, was not the collecting station to which all the wounded men were brought too important to be under the command of only two sergeants? It seemed impossible to allow so important a place as the "collecting station," where wounded were certain to accumulate, to be cared for by any sergeants, however careful. The presence of a medical officer seemed to him absolutely essential, and at least four private orderlies in addition to the sergeants to work at loading and placing the wounded in the ambulance waggons, or for placing the wounded on the mule cacolets and litters—a very trying and tedious work. They thus seemed to need, even in the front of the dressing station, an increase of four orderlies and two doctors. At the dressing station itself an extra surgeon was needed to assist at the operations, and an increase of private orderlies for cooking, caring for the accumulated wounded, and for water carrying—say at least ten men were needed to make the dressing station efficient. All this would add to each bearer company three doctors, and some fourteen or fifteen orderlies. Without a certain further increase, the present bearer company could not work well in war time. The Medical Staff Corps was, however, insufficient in itself to do all this work for a complete army corps in the field. A proposal had been made that

to overcome this difficulty there might be formed a Militia Medical Staff Corps, which could be called out each year for training in ambulance and nursing duties. They could be formed into district militia companies of the Medical Staff Corps, and dressed in medical uniform, and regularly trained every summer at the district headquarters in all military ambulance and nursing work. Two thousand such men trained yearly would be of enormous help in any foreign war. It was essential to put these men into medical corps uniform, so that their *esprit de corps* might be increased, and that they might take increased interest in their work. For Scotland, probably, 200 such men would be under training, and they could assemble every summer at Edinburgh, or other military centre, and go through all ambulance and field hospital training.

He attached much importance to an efficient militia medical organization as economical, and as being ready at once when war occurred to take the place of the regular medical corps. He came now to ask how the volunteer army stood in relation to this question? They stood exactly where the regular army did on the 20th September 1854. They could not be called an army. They would be altogether unable to deal with their wounded as armies of the present day were. They had only the regimental surgeon and bearers. There was no bearer company. It was essential that there should be a trained bearer company in each county for the volunteer army. These trained men might be useful beyond the sphere in which they were trained. They might be counted on to supply places in the regular army in war time. To work this volunteer service properly they wanted only officers. These they must have from the medical profession, and on it lay the whole responsibility. Already a step had been made. They had begun to train medical students, and the training would be most beneficial to them. In the civil hospitals they were not taught hospital organization as they would be in a medical staff corps. The discipline would also be of great benefit to them. When trained they would furnish the country with a body of young red-cross doctors. It might be thought a waste of time and quite unnecessary to teach a medical student how to carry a stretcher, but the student must learn all these things. He must learn to obey in order that he might command; for the army doctor of to-day must be not only physician and surgeon, but must be able to make the machine go. The students would also be the future officers of these bearer companies. With the most intense self-sacrifice this work had been begun among the medical students of London by Mr Cantlie. He had already trained 360 of them, and 100 went to Aldershot in July to receive training along with the privates of the Medical Staff Corps. This volunteer movement had been aided in London by the formation of a Volunteer Medical Association. The volunteer officer could not go to the War Office

by himself, but when he formed an association with a number of people interested in ambulance work, he could make what suggestions he pleased, with the knowledge that they were more likely to be listened to and adopted. There should be in every English and Scotch county at least 10 officers and 100 men of a county division of the Volunteer Medical Corps, in addition to all existing volunteer regimental surgeons. These county companies would be dressed in medical uniform, be officered by non-regimental volunteer medical officers, and should form an administrative battalion for the division. To this battalion a brigade-surgeon of volunteers would be posted as commandant, and an officer of the Army Medical Staff should be attached as instructor and adjutant. The whole would be under the general command of the Principal Medical Officer of the district. This would equip the volunteer army with the elements of medical aid; and no doubt whatever, in war time, officers and men in certain numbers might come as volunteers for war. What was wanted, above all things, was disciplined trained war aid, and by carrying the ambulance work into the schools this could be achieved. A military volunteer medical reserve would thus be formed, recruited from young surgeons of the house-surgeon class, who, with a volunteer commission and good pay and allowances and ample reward, would come to the Army Medical Staff for war. This war reserve would be enrolled yearly by the War Minister sending out circulars every December to the schools, and inviting young medical men to promise to come to war, if any occurred in the ensuing year. In the following December the surgeon would be again free. There was ample room in our army corps scale for volunteer doctors, if trained and disciplined. One such officer might be posted to each battalion as a second doctor. One or two might be attached to the bearer company of each brigade. One might be posted to each stationary hospital, and there was room for several in the transport work on the communications. Underlying all lay the questions of discipline, *esprit de corps*, and morale. If these existed all might go well, without them all was impossible.

The medical service was to-day evoluting itself out of former chaos. That evolution would be aided by the sympathy of the civil profession; that sympathy must be based on knowledge, and to disseminate that knowledge he had given this very elementary lecture to-night. The civil profession were entirely ignorant of the military medical system; they knew little of the need of forethought and anxious pre-arrangement of all things needed for war. Hence the army medical service looked in vain for active intelligent help in its development. In the future it would not be so; the students to-day knew more of their work. They were sowing the seeds of future knowledge in their minds, and good fruit might one day come. They stood in the army true alike to the soldier and the profession of medicine; standing fast

by science, but also by discipline; proud of medicine, but soldier-surgeons also. In that army they were not outsiders, but a corps, and an important corps, sharing every danger, and claiming just reward from England. With just and evenhanded treatment every success was possible, but without it any system, however good, must fail.

The President said he was sure he expressed the feelings of every member of the Society when he said they were much indebted to Surgeon-Major Evatt for the very able and interesting statement he had brought before them. For himself, he had to say that he was in a state of very dense ignorance on these matters. He felt that he had got a certain amount of knowledge in a wonderfully pleasant way, and in a very short time. It was delightful to see a man so full of enthusiasm tempered by good sense, and able to marshal his facts as Dr Evatt had done. Mr Cantlie was with them, and he hoped he might venture to call upon him to give his experiences in dealing with the London students.

Mr Cantlie said he should like to say a word or two as to the formation of a Volunteer medical association in Edinburgh. There was one formed in London, and it was to this or similar associations in the country that he looked for the bringing forward and developing, for it scarcely now existed, the Volunteer medical service. Destitute of an organized medical service, the Volunteer army must ever remain as a show or marching-past army. It was not to the credit of the medical profession that the splendid force now bearing arms in the Volunteer service should be branded as useless, because the doctors have not bestirred themselves. It was to this end that the Volunteer Medical Association was founded, and it was to create common action amongst the Volunteer surgeons that it was intended to found local branches of the Association throughout the kingdom. There seemed, however, to be an apathy among Volunteer surgeons about organizing themselves. He had recently addressed 3300 circulars to Volunteer surgeons throughout the country, and from these he had only 47 responses. The parent Association in London had tried to bring the Volunteer surgeons forward, but had almost given it up in despair. The scheme in the last circular was that there should be a number of associations formed throughout the country, looking upon the Association in London as the parent. In this way they would be able to bring the claims of the surgeons before the authorities. Many things had to be asked for: such as proper rank, promotion, the formation of a staff, employment of and pay when during war the civil doctors were called in, the question of equipment, formation of an army medical reserve, and such like, that could be carried through only by the combined voice of the Volunteer surgeons generally. The medical profession in this country was split up into two sections, the civil and military.

The members of either party know little of, and care less about, the working of the other. The special knowledge and training of an army surgeon were lost to the civil profession. There were 800 men of the Army Medical Staff who were specialists in hospital organization and sanitation. How many practitioners in civil life knew anything of such things? Hospitals were left to secretaries and governors, and if anything went wrong with their patients' houses they must have a "man" to look to the drains, etc. The civil surgeon knew when the drains of a house or hospital were out of order when his patients died of pyæmia or diphtheria, and he knew that they were all right after they had been seen to only by his patients not dying of such diseases when the ward was reopened. The ability to test the drainage, or to know anything about it, he did not consider his business, and he had had no training therein. Then, again, in regard to hospital administration and organization, What did the surgeons and physicians who lent their services to these institutions know of such matters? It was left to laymen, and the doctor only knew something was wrong financially when a ward was closed or some item in drugs or comforts had been forbidden. Now, the only branch of the medical profession which had received any training in such matters, the army surgeons, they, the civil practitioners, had completely ostracized. In this country, it might be fortunately, the civil doctor did not have an opportunity of distinguishing himself in war. On the Continent it was different. Who would have heard of Esmarch of Kiel, a surgeon in a fourth-rate German town, had it not been for his war services? Langenbeck, Reyher, and others had been brought to the front by their war services. It was not, however, the glory of attending the wounded on the field of battle which continued these men in the position they were. No; it was the training in organization and hospital administration which gave them a power in their respective countries, such as no untrained civil practitioner could ever hope for. But, he said, they threw away 800 valuable men, and let them wear their lives out on pensions, instead of either imitating them in their training, or bringing them amongst them and making them useful to them. What caused so many hospital scandals where the doctors had to do with management? Not want of scientific skill, but absence of the bare elements of system and administrative powers, which could not come without training. It was to be hoped that one day such form of teaching and training would be inculcated upon every medical student, and that by-and-by the medical profession in this country would be taught to walk by itself and manage its own affairs. Many young surgeons had tendered their services at the head-quarters of the Volunteer Medical Staff Corps in London, but they could not see the advantage of going through any form of drill or previous training. Their profession, said they, was similar in the civil or military hospital, on the field of battle or

elsewhere. That was an example of the opinion of the most intelligent of young civil practitioners, and it was on a footing with that held by the medical profession generally in Britain. In every country in Europe except our own every doctor had to join the army, and he thereby received a training in system and administration which served him in good stead for the rest of his life. In regard to the formation of a Volunteer Medical Staff Corps, that was a thing of secondary importance to the development and organization of the Volunteer medical service generally; but they could not have officers fit to undertake any such work unless they were previously trained, hence it was that the medical students, as future officers, were first called upon to undergo a training. In London very nobly had they responded; and at the present moment there were 300 medical students and about 100 laymen, formed into four companies, in a high state of efficiency. The Government had granted an adjutant and four instructors, besides the usual money grant, for the purpose of training the battalion. It was to be hoped that two companies—one of medical students, the other of laymen—might be formed in Edinburgh, a third in Glasgow, and a fourth in Aberdeen. As soon as these were recognised, they would have an adjutant and instructors granted for Scotland. The two companies outside Edinburgh would be recognised as outlying companies of the corps, the headquarters of which would be in Edinburgh. Pressure could only be brought to bear upon the authorities by a body of influential men in a district banding themselves together and representing their wants to the proper authorities. Individuals could do nothing with State authorities; but were a branch of the Volunteer Medical Association formed, consisting of influential laymen and doctors in Edinburgh, the Volunteer surgeons could command attention to their wants in terms which must command a hearing. He would suggest that as soon as possible a branch of the Volunteer Medical Association be formed in Edinburgh.

Dr Wolseley, P.M.O. for the North British District, said Drs Evatt and Cantlie had gone over a wide field. In the days when he first joined the service, the junior medical officer or assistant-surgeon went into the field four paces behind the colours. He was four paces behind them at the Alma, and he did not think he was worth twopence there. They had now a very different system. They had worked out from this state of disorganization a system that was nearly perfect. He did not altogether agree with some of Surgeon-Major Evatt's suggestions. He thought, in particular, that two surgeons to a battalion in war time were too many. The surgeons were too valuable to be put there. The formation of a Volunteer Medical Association was a practical point, and he should do what he could to help the movement. He had that day seen the General commanding the district, and

told him of this meeting and its object. The General authorized him to say that it met with his approval, and would have his support in every way. He trusted that the matter would not end in words.

Dr P. A. Young said it cheered the hearts of those who had been working long at this ambulance organization to have such addresses as they had listened to that evening from Surgeon-Major Evatt and Mr Cantlie. He had acted with the German army in the Franco-Prussian war, and had been so struck with their organization that he had, on returning to this country, written to the public papers urging its adoption in our own army, regular and volunteer. He had particularly advocated that the volunteer surgeon, instead of simply marching in the rear, should train members of his corps in ambulance work. He held that, instead of training only two men from each company, every man should receive the rudiments of such training. Every rank and file in the German and Austrian armies was taught the use of Esmarch's bandage. If a soldier were wounded in a large artery he might bleed to death before the bearers reached him; but if his comrade knew how to apply the tourniquet, his life might be saved. The volunteer army was still very far from perfect in its medical department. They had done a little to remedy that defect, having formed four bearer companies in London, and last year they had attempted the formation of such a company in Edinburgh. They hoped to have another company formed of laymen next spring. Such a company could be readily formed by the men trained under the St Andrews Ambulance Association. The volunteer surgeons could help forward the movement by forming an association. They could speak with more confidence collectively than individually.

Mr Cathcart said the students in Edinburgh had not been behindhand in endeavouring to organize a Volunteer Medical Staff Corps. They had had, however, to fight under the greatest possible difficulties. They had no funds nor other appliances, no stretchers. They had to find their own instructors, and those of them who acted as officers had to pick up their training as best they might. The students had felt this disadvantage, and their original numbers had lately dwindled down considerably. They had still forty or fifty members on the roll, and that afternoon there had been another enrolment. If, however, they were to continue and be efficient they must have some backing up. The general public must help them with funds and interest. The formation of a Volunteer Medical Association would be a great help.

Dr Caverhill gave a short account of the ambulance training in the different yeomanry regiments in Scotland. He had introduced into the East Lothian and Berwickshire Yeomanry Cavalry what was called the Victoria Cross competition; this was

intended to train the troopers to rescue their wounded comrades lying in positions of great danger. It consisted in:—1. Riding at full gallop over a hurdle 3½ feet high; 2. Decapitating a dummy enemy; 3. Dismounting and placing a figure of a wounded trooper on his horse; 4. Remounting; and 5. Galloping back with the figure astride in front, and jumping the hurdle on the way. The competition was very popular, sixteen of the troopers having become most proficient in it. He urged that they should press on Government the necessity of establishing large camps annually or periodically, where all the different arms could be combined, and an opportunity afforded the auxiliary forces of learning practically something more than mere parade movements; the camp to be supplied with a field hospital where the bearer companies could be efficiently trained in its different departments. He should like to ask Surgeon-Major Evatt if there was any organization for giving first aid to the wounded cavalry in the regular army?

Surgeon-Major Evatt thought Dr Caverhill had raised a very important question. He did not know what provision, if any, existed for the giving of first aid to a wounded cavalry soldier. The only experience he had on the point was that when he went out to Suakim in February, having landed just before MacNeill's zereba fight, an order came to him to join the cavalry brigade, and march to Hasheen. He at once asked for an escort, and obtained twenty-five hussars. But the bearer company he commanded was entirely on foot, and equipped as infantry, and could not possibly keep up with quick moving cavalry. By the merest chance—as he was marching across the plain, quite detached from the cavalry brigade, with whom his dismounted men could not keep up—he met Sir Gerald Graham, who, seeing the dangerous position the company was in, ordered them at once into the square, where all the non-cavalry troops were safe from attack. Sir Herbert Stewart had written a highly interesting minute on the subject of the bearer company with cavalry; and no doubt whatever existed that the present infantry bearer company with cavalry was unfit for war work, and would certainly fail in any real warfare. What was needed was a well-mounted lightly equipped bearer company, with many mounted men, light ambulances, and horses with cacolets and litters, and very light equipment. This company should bear the same relation to the ordinary bearer companies that a battery of horse artillery bears to a field battery. The question also existed if one surgeon per cavalry regiment was sufficient in the field. The duty was heavy and exhausting, and two men at least needed. In all these questions enlightened public opinion was needed, and it was only by such enlightenment that real war efficiency could come. In conclusion, he desired to thank the Society for the very kind reception he had received.

The President moved a very special vote of thanks to Surgeon-Major Evatt for his address. This was unanimously agreed to.

Colonel Jones, Q.E.R.V.B., moved a vote of thanks to the President and Council of the Society for the kind invitation they had given to the volunteer officers to hear the interesting and able address by Surgeon-Major Evatt.

Meeting III.—December 2, 1885.

Professor GRAINGER STEWART, *President, in the Chair.*

I. ELECTION OF ORDINARY MEMBERS.

The following gentlemen were elected Ordinary Members of the Society:—Robert W. Felkin, L.R.C.P. & S. Ed., F.R.S.E.; S. Hall Puckle, B.A. (Cantab.), M.B., C.M. Edin.; James Haig Ferguson, M.B., C.M. Edin., M.R.C.S.

II. EXHIBITION OF PATIENT.

Dr Bennet showed a female child, 6 weeks old, suffering from CHRONIC INDURATION OR CONGENITAL TUMOUR OF THE LEFT STERNO-MASTOID. The condition was first noticed by the mother a week after birth. The whole of the muscle except the attachments was affected, there being in its place a dense indurated tumour or rigid band, over which the skin was freely movable. There was permanent wry-neck. This affection had been ascribed to various causes, such as to simple hypertrophy, to injuries received during birth, and to syphilis, but that had been abundantly disproved. Dr Frederick Taylor had shown by post-mortem examination that there was a development of fibrous tissue in the muscle, which ultimately destroyed the muscular fibres. In most cases the *right* side was the one affected, hence the theory of its occurrence in certain fœtal presentations. In this instance it was the *left* side, and that more extensively than was usually described. The labour had been normal, and the mother had already given birth to nine or ten healthy children.

Dr Duncan had seen a similar case that morning at hospital, but the affection was on the right side.

Mr Joseph Bell had seen the condition four or five times in all. His experience was that it disappeared in two or three months.

III. EXHIBITION OF PATHOLOGICAL SPECIMENS.

Dr Skene Keith showed (1) A FIBRO-CYSTIC TUMOUR of the UTERUS, which, with its fluid contents, weighed almost 15

pounds. It was composed of one large cyst, and at no point was the wall an inch in thickness. The growth of the tumour had been very rapid, and it was first noticed fully two months after the cessation of menstruation at the age of 44. In one week it grew from the level of the umbilicus up to the sternum, and slightly raised the ribs. (2) A VERY MUCH LOBULATED UTERINE FIBROID, which weighed 11½ pounds. The bladder had been pushed out of the pelvis by the tumour, and extended upwards to within 2 inches of the umbilicus. Fortunately, however, it was not adherent, and slid back into the pelvis when the tumour was drawn out.

IV. Exhibition of Instrument.

Dr Foulis showed an IMPROVED CATHETER to be used with the instrument he had shown at a previous meeting for washing out the bladder. It consisted in a stopcock fitted at the end of the catheter, which, when closed, prevented any of the fluid passing to the bladder escaping, or of air entering. The same thing had to be done before by the finger or thumb of the surgeon, but that rendered the passage of the catheter more difficult.

V. Original Communications.

1. ON THE OPERATIVE TREATMENT OF POPLITEAL ANEURISM.

By Thomas Annandale, F.R.C.S. Ed., F.R.S.E., Regius Professor of Clinical Surgery in the University of Edinburgh.

THERE are now few surgeons who, when called upon to treat a case of uncomplicated and limited popliteal aneurism, do not first try the treatment of it by some form of compression. My own experience leads me to prefer either digital compression or a modification of Reid's method in these cases. My two last cases in private practice were treated successfully in the following way. An Esmarch's bandage was applied to a point immediately below the aneurism, and then pressure was made by means of a horse-shoe tourniquet upon the femoral artery at the groin. From time to time this tourniquet was slackened slightly, so as to allow some blood to flow into the sac, and was again immediately tightened. This treatment was carried on for from two to three hours at a time, an elastic bandage being applied, but not so as to stop the circulation in the limb, after the tourniquet and Esmarch's bandage had been removed. An interesting point in both cases was that the patients were not confined wholly to bed during the treatment, but were allowed to lie on a sofa, and even to sit up with the limb resting upon a chair. Both cases were completely cured,—the one in two weeks, and the other in about three weeks. In the one case

only one application of the tourniquet was employed, the patient having after the application an elastic bandage constantly round the limb, but not used so as to interfere with the circulation. In the second case two applications of the tourniquet, at an interval of a week, were required, and the use of the elastic bandage for two weeks after the second compression. It is a well-known fact that cases of popliteal aneurism are occasionally very easily cured, and it may be that my two cases belonged to this class; but, as they were both under treatment about the same time, I have thought a brief note of them might be interesting.[1]

When compression fails to cure a popliteal aneurism, or when the case is one unsuitable for it, the treatment almost invariably suggested and practised is ligature of the femoral artery at the apex of Scarpa's triangle. Should ligature of the femoral artery fail to cure the disease, or should pulsation in the sac return and persist after this operation, the usual advice and practice is to try compression above the seat of ligature, or to try the flexion method; or, these failing, to tie the external iliac or common femoral arteries. Should these plans not succeed, there is, as Erichsen[2] (*Science and Art of Surgery*, 8th edition, vol. ii., page 130) remarks, only the choice between "amputation and opening the sac." He further says:—"Of these measures I should certainly prefer amputation, as offering the most favourable chance to the patient." Mr Erichsen continues:—"The operation of opening the sac, turning out its contents, and ligaturing the vessel supplying it, is in any circumstances a procedure fraught with the greatest danger to the patient, and full of difficulty to the surgeon, even when he knows in what situation to seek the feeding vessel."

There are certain local conditions of a popliteal aneurism which are recognised by all surgeons to render the case unsuitable for compression. Among the principal of these local conditions are:—

(1.) Large and rapidly growing aneurisms.

(2.) Diffused and ruptured aneurisms.

(3.) Aneurisms tending to involve or involving the knee-joint.

(4.) Inflamed and suppurating aneurisms.

In addition to these local conditions may be mentioned an unhealthy state of the arterial system.

In the first three of these conditions the common rule followed is to try ligature of the femoral artery, but most authorities qualify this opinion by stating that the ligature of the artery is a very uncertain treatment in these cases, and that amputation will not unfrequently be required. In aggravated examples of these con-

[1] A third case recently treated by this same method was not cured, and ligature of the femoral artery was required.

[2] I quote Erichsen because he is a deservedly high authority upon the subject, and his work on Surgery has been quite recently carefully revised and brought up to date.

ditions immediate amputation is advised by some, as the ligature of the femoral artery frequently tends to produce gangrene of the limb.

In the fourth condition amputation has generally been resorted to, although laying open the sac has been performed under these circumstances. Erichsen (*loc. cit.*) observes:—"Though this plan has been several times tried, I am not aware that by it the surgeon has ever succeeded in arresting the bleeding from a suppurating aneurismal sac."

The present state of opinion in regard to the treatment of popliteal aneurism may therefore be summed up as follows:—

(1.) Compression in favourable cases, and when it can be borne.

(2.) Ligature of the femoral artery when compression fails, or is unsuitable.

(3.) Amputation when certain local conditions or complications exist.

The "old" operation, or laying open the sac and securing the artery at its point of communication with it, is occasionally referred to by authors, but it is certainly never advocated in the case of popliteal aneurism, and in the passage quoted from Mr Erichsen the general opinion in regard to this proceeding is, I think, correctly expressed.

While, then, I advocate the treatment of popliteal aneurism by some form of compression in suitable cases, and this failing, by ligature of the femoral artery, my object in this paper is to express the opinion that the "old" operation has hitherto been too much ignored by surgeons, and that in certain cases of this disease it will prove to be a more safe proceeding than those methods which are usually adopted.

It may be well to remark here that, before the introduction of the Hunterian ligature, popliteal aneurisms were not unfrequently treated by laying open the sac, but the success then of such a proceeding was very slight, and this is not to be wondered at when we consider what this operation was. It consisted in freely laying open the sac, and then stuffing its cavity with some dressing, or in some cases pushing a hot cautery into its interior. If any attempt was made to ligature the artery at the site of the aneurism, it was simply a dive with a needle and thread in the position of the vessel, with the result that, when such a ligature was passed and tied, it usually included vein, artery, and other structures.

The "old" operation at the present time is a very different proceeding, and, in my experience of it, which has not been small, I have failed to meet with those difficulties so graphically related by Mr Erichsen. With the antiseptic ligature and dressing, I now

look upon this operation as a very simple proceeding in properly selected cases, provided you can stay the circulation in the sac during the operation, and you can always do this in a case of popliteal aneurism.

In order to explain my method of operating, I have had this diagrammatic sketch prepared. It is supposed to represent the

cavity of the aneurismal sac after it has been laid open and all the clots removed. *a* is the opening of communication with the artery, into which a bougie, *b*, has been inserted, and passed along the canal of the vessel upon its cardiac aspect. *c* and *d* are the two small incisions made through the wall of the sac, immediately above the opening, and the aneurism needle, *e*, is shown after its point has been passed through these incisions and under the artery, with the contained bougie. By means of the aneurism needle the ligature is drawn through and tied round the vessel upon the bougie, the latter being gradually withdrawn as the ligature is tightened. Should there be only one opening, and this is the case in a very large majority of instances, the same proceeding is carried out upon the distal end of the artery, the bougie being inserted into the opening again and passed downwards. If two openings exist they must be treated separately. The employment of the bougie was first suggested to me several years ago by Sir Joseph Lister, when I was operating upon a case of femoral aneurism.

I will now relate a case in illustration. U. N., æt. 42, was sent to me in August of this year by Dr Hern, of Darlington, on account of a popliteal aneurism affecting the right leg. The patient had suffered from obscure pains, attributed to rheumatism, in this leg for one year and three months before his admission into my wards,

but he only noticed a swelling in the popliteal region of this same leg about three months ago. Since first observed, the swelling, which pulsated strongly, has rapidly increased in size.

On examination, his condition of health was not very favourable. There was a slight systolic murmur over the mitral area, and the radial and temporal arteries were tortuous and affected with atheroma. The other organs were healthy. In the right popliteal space there was a large pulsating and expansile tumour, which filled the whole space, bulging out on each lateral aspect, but more particularly upon the inner side. A portion of the tumour felt firm and solid, but other portions were soft and fluctuating. A well-marked bruit was heard when the ear was placed over the aneurism, and the pulsation was especially marked over its centre. The leg below the knee was slightly swollen and œdematous, and the pulsation in the tibials at the ankle was very feeble.

After consideration, I decided to treat the case by the "old" operation, and upon the 2nd of September I made a small incision into the aneurism, the circulation of the limb being controlled by a tourniquet applied round the upper third of the thigh. Having introduced my finger into the wound, and by means of it loosened the adherent clot in the sac, I laid the whole sac freely open, and removed all the clots contained in it, and I then found that there were two openings communicating with the sac,—one corresponding to the upper end of the popliteal artery, just at its junction with the femoral, and the other to the lower end of the popliteal artery. Both of these openings were pervious, and admitted a No. 10 bougie, which passed freely into the canal of the artery. The sac of the aneurism was entire, and its inner surface was lined with many layers of firm and laminated clot, and in addition there was a considerable amount of soft and recent clot in its cavity. The two openings in the sac were now separately secured, after the manner shown in the sketch. By means of the aneurism needle catgut ligatures, prepared with chromic acid, were applied, and when the tourniquet was removed there was no bleeding from the vessel. The external wound was now stitched and a drainage tube introduced. Irrigation with a solution of corrosive sublimate (1 in 2000) was employed during the operation, and the wound was dressed with corrosive sublimate wool. His progress was perfect. Before the 10th of September the drainage tube was removed; upon the 27th of September the wound was healed, except at one small spot, the site of the drainage tube, and the patient sat up in an arm-chair. Three days after this he was allowed to walk a little in the ward with crutches, an elastic bandage being applied round the limb as a support. Upon the 15th of October he was discharged cured. On the 3rd of November, Dr Hern, in a note to me in regard to another patient, writes:—"Norris is quite well, and at work."

My reasons for deciding upon the "old" operation in this case were—

(1.) The unhealthy condition of the general arterial system.
(2.) The large size of the aneurism, and its rapid growth.
(3.) The œdema of the leg, and feeble condition of its circulation.

The case was quite unsuitable for pressure, and it belonged to that class of cases already referred to, in which ligature of the femoral artery is acknowledged to be not only uncertain as regards the cure of the aneurism, but to be attended with a considerable risk of gangrene of the limb, secondary hæmorrhage at the seat of ligature, a risk not now so great as formerly, or inflammation and suppuration of the sac.

It may be said, and has been said, that if the arterial system is unhealthy it is most likely that the artery in the region of the aneurism will be especially affected and unsuitable for ligature; but Mr Syme proved the fallacy of this in connexion with his brilliant operations after the old method; and having myself performed many operations of a similar kind, I can confirm his opinion, for I have never seen secondary hæmorrhage occur when the old operation has been carefully performed with antiseptic precautions.

In favour of the "old" operation in my case, was the certain and speedy cure and obliteration of the sac provided all went well; the immediate removal of the large tumour, which was pressing upon the veins, and probably also upon the arteries, and interfering with the proper circulation of the limb,—so that in this way two of the principal risks, gangrene of the limb and suppuration of the sac, were in great part done away with; and, lastly, that if any of the risks already mentioned had followed my proceeding, and amputation been necessitated, an amputation could have been performed lower down in the thigh than in the case of ligature of the femoral artery, and therefore with less risk to the patient. But I have additional experience to support my opinion. In the *British Medical Journal* for 17th April 1880, I published the notes of a case of popliteal aneurism treated successfully by the same proceeding. This case was that of a man, æt. 36, who, seven years before he came under my care, had his femoral artery ligatured in Australia, after pressure and flexion had failed to cure the aneurism. The ligature of the artery was successful, and the disease apparently remained cured until a few weeks before he consulted me, when pulsation had returned, and the tumour steadily increased in size. In this case I laid open the sac, and secured the popliteal artery at the point of its communication with the sac. This patient was perfectly well in six weeks, and remains well. In some remarks upon this case I then wrote:—"The case is an additional proof that the popliteal artery may be successfully ligatured;" and again, "I have hopes that the successful result of this case may in the future cause it (the "old" operation) to be practised with more encouragement in some of those cases which

have hitherto been treated by amputation." Further, I have proved that both popliteal artery and vein may be successfully ligatured; for in the *Lancet* for 24th April 1875, I reported a case of arterio-venous aneurism of the popliteal artery, the result of a wound, involving the artery and vein, in which I laid open the sac and secured both popliteal artery and vein at their points of communication with the sac. This patient was completely cured in five weeks. These are the only cases of popliteal aneurism in which I have performed the "old" operation, and therefore I have no unsuccessful cases as yet to record. From my experience of these three cases, and from my experience in other varieties of aneurism, I feel justified in expressing the opinion, that the "old" operation is to be preferred to ligature of the femoral artery in Scarpa's triangle in the following conditions of popliteal aneurism:—

(1.) In cases of large aneurism filling up the space, and interfering by pressure with the venous and other circulation of the limb below, or causing serious nerve pressure.

(2.) In rapidly growing aneurisms, which have attained some size.

(3.) In ruptured and diffused aneurisms.

(4.) In aneurisms which have involved the knee-joint by pressure.

(5.) In aneurisms attacked with inflammation and suppuration.

(6.) In aneurisms which the ligature of the femoral artery and compression have failed to cure.

(7.) In arterio-venous and other aneurisms of traumatic origin.

(8.) In cases of general arterial disease, provided surgical interference is considered necessary or advisable.

In such of these conditions, which are of an acute nature, there must be no delay in performing the operation; and I need scarcely add, that should symptoms of gangrene already be present in any case, amputation is the rule.

Dr Duncan considered the paper a valuable and practical one. There were many points in connexion with the treatment of popliteal aneurism that were of great interest. The question of the efficacy of Reid's method was of importance. So also was the question of its mode of action. In one instance compression had been made by it for the remarkable period of six hours with no appearance of gangrene. But coagulation did not take place. In another instance compression by tourniquet had been made over the abdominal aorta for twenty minutes, and coagulation resulted. Such facts indicated marked hæmic differences, and also perhaps that they might carry Reid's treatment further than was usually considered safe. Though the six hours failed in the case referred to, the patient was again put under the treatment for two hours, followed by a day's digital compression, and was cured. To

a certain extent he should be inclined to agree with Mr Annandale in applying the old operation—to traumatic cases, for example. A most interesting case was that to which Mr Annandale had referred. It was one in which he had assisted, and Mr Annandale had tied both vein and artery. It was probably unique at the time. In some other instances he should also agree with Mr Annandale; for example, such an one as that he related in which the aneurism interfered with the circulation both to and from the limb. He was inclined to doubt its propriety in suppurating aneurism. He would open the sac if an abscess, but would tie the vessel at a sound point above it, and if feasible dissect the aneurism completely out. Mr Annandale had been hitherto fortunate in his employment of the old operation, but he must not expect to be always so. He would meet with a difficulty sometime. Dr Duncan had assisted Mr Syme in some of these operations, and most formidable they were. In one case, which ought to have been diagnosed as a fusiform aneurism, but was not, an incision of thirteen inches had to be made before the two ends of the artery were laid hold of and tied. It was not always possible to say in popliteal cases whether the aneurism was sacculated or not.

Mr Bell said that he had been anticipated in much of what he wished to say by Mr Duncan. He had assisted Mr Syme at the case referred to, and it was a most formidable affair. Mr Annandale had modestly omitted to mention in his paper that the idea of using bougies to insert in the arterial openings into the aneurism was his own. This was a very great help in the performance of the old operation. He did not agree with him in recommending the operation in cases where the knee joint was opened. He thought that amputation would have a better result. Otherwise he was inclined to agree with him. He thought, however, that they must remember the effect of the personal equation in all these operations. If the surgeon knew the parts he was dealing with in the popliteal space, he might do the old operation, but if not, it might be a much safer thing for him to stick to the other method, —ligature of the femoral.

The President mentioned an awkward case which had come under his cognisance of abdominal aneurism where pressure had resulted in a fatal rupture of the aneurism.

Prof. Annandale said there were one or two cases on record in which Reid's method applied for two or three hours had caused gangrene. In regard to the case of arterio-venous aneurism mentioned by Mr Duncan, he thought that if he had another case of the same he would adopt a plan he had seen practised by Sir Joseph Lister, in which he tied the artery, but sewed up the aperture in the wall of the vein, and so did not interfere with its canal. There was thus less risk of gangrene. He did not think he would care to treat a suppurating aneurism in the way suggested by Mr Duncan, dissecting it out entire would be a very formidable

operation. It would be easier to ligature above and below the opening in the artery, and treat the sac as an abscess with careful antiseptic precautions. With regard to what Mr Bell had so kindly remarked there could be no doubt that the introduction of a bougie into the opening in the vessel made the performance of the operation very much easier. He could not agree with him that amputation was best when the knee joint was implicated, because the implication of this joint was usually only by pressure causing some absorption of the bone or other textures. If the sac were laid open with antiseptic precautions the joint need not suffer from the operation. He was also of opinion that the average surgeon would find the old operation much easier than ligature of the femoral artery.

2. ON RE-INFUSION OF BLOOD IN PRIMARY AND OTHER AMPUTATIONS.

By John Duncan, M.A., M.D., LL.D., F.R.C.S. Ed., F.R.S.E., etc., Surgeon to the Royal Infirmary, Edinburgh; Lecturer on Surgery, Edinburgh School of Medicine.

On October 21st, 1885, Dr Lindsay Porteous, of Kirkcaldy, sent to me a case of machine injury. The left leg had been crushed, and amputation was required in the lower third of the thigh. There had been no hæmorrhage at the time of injury, but Dr Porteous, as a measure of precaution, had placed a tourniquet loosely round the limb, with instructions to tighten it if necessary. Bleeding commenced during the journey; the tourniquet was insufficiently screwed up, and a large quantity of blood was lost before the patient reached the Infirmary. When I saw him eight hours after the accident he was pallid and collapsed, with a pulse, when perceptible, quick, irregular, and fluttering. Alcohol, ether-injection, and elevation of the limbs had a scarcely appreciable and quite evanescent effect; and I came to the conclusion that it was impossible he should lose his leg and live through the operation. Intravenous injection seemed the only hope, and it occurred to me that I might to a certain extent utilize the patient's own blood for the purpose. In a large school like this, there is no difficulty in finding blood-givers during the day, but at night a saline fluid is the imperfect alternative.

The patient was anæsthetized with chloroform followed by ether. While I rapidly removed the limb, the blood which fell from it (in all about three ounces) was caught by an assistant in a dish containing solution of phosphate of soda. After the arteries had been tied, it was difficult for a time to say whether the patient was dead or alive; but I proceeded to inject the blood and phosphate of soda, mingled with distilled water in the last syringeful to increase the quantity. In all, about eight ounces

were thrown into the femoral vein on the face of the stump. The quantities are not exact, because the graduated dish was necessarily flat to catch the blood, but are correct within a drachm, or at most two.

The patient was then quickly put to bed, placed in front of the fire, and teaspoonfuls of weak brandy and water were given to him frequently. The pulse had become quite perceptible by the time he had been got into bed; it steadily improved during the night, and the man is now perfectly well.

The dominant idea in the procedure is to utilize the blood flowing from the amputated limb, which otherwise must necessarily be lost. Especially in shattered limbs, it is difficult to empty thoroughly before amputating; and both at the moment of incision, and also while ligaturing the arteries, a certain quantity of blood may always be caught. The importance of even a few ounces in cases of collapse can hardly be overestimated. No doubt, a simple saline fluid may for a time supply the means of working to the empty heart and vessels; but, in my experience, the benefit is only temporary—for one reason, because it is essential that the blood-forming organs should act; and they require suitable nourishment like every other part of the frame.

I am convinced that this little operation, so easily performed, will save many lives in the collapse of primary amputations, and will prove beneficial to wasted and anæmic patients in the major amputations for disease. I have now performed it in a sufficient number of cases, one of them an amputation at the hip performed by my colleague Mr Miller, to enable me to speak with confidence as to its safety and value.

The idea would probably not have occurred to me had I not, during the previous six months, had considerable experience in transfusion of blood from one human being to another. My colleague, Dr Brakenridge, having under his care a case of pernicious anæmia, in which the decadence was so rapid that the end could not be postponed many weeks, came to the conclusion that it would be right to try transfusion of blood, and consulted me on the subject. I had tried myself, or seen tried by others, most of the instruments hitherto in use for direct transfusion, and had arrived at the opinion that all were unsatisfactory, either from the risk attending them, or from liability to failure in attaining the desired end. It appeared to me, therefore, that it was necessary to adopt the method of defibrination, or to delay the coagulation of the blood by some of the saline additions which have already been used for the purpose, in order that a sufficient quantity might be injected with sufficient slowness.

In making inquiry as to the experience of others, I was informed by my colleague, Dr Cotterill, that he had on one occasion performed transfusion of blood mingled with phosphate of soda, as recommended by Dr Pavy, and that the immediate result of the

operation had been all that could be desired. As the power of phosphate of soda to delay coagulation is undoubted, I determined to adopt a plan whose feasibility was thus assured.

It is unnecessary now to go into the history of the pernicious anæmia. Dr Brakenridge will doubtless give the results of his very careful observation when the case may be regarded as complete. Suffice it to say that, by four transfusions, the quantity of the red corpuscles and hæmoglobin was trebled, and that the improvement has been maintained for two months without further operation.

Before describing the mode of operating, I will merely mention another of our transfusion cases, highly creditable to my last house-surgeon, Dr Carmichael, which he intends to publish more fully, along with some important experimental investigations on which he is engaged. I had operated in a case of empyema by resection of portions of seven ribs. A certain amount of blood was unavoidably lost during the operation, and through the night slow oozing took place into the thoracic cavity, making little show outside the dressings. Next day the patient seemed moribund; and as he found that I was from home, Dr Carmichael, who had admirably assisted me in the other operations, had himself bled to six ounces, and injected that quantity with phosphate solution into the patient's veins. The man immediately rallied, and is now quite well.

An operation of this kind plainly requires attention to detail, but its extreme simplicity renders easy the avoidance of mistakes, some of which I committed in the earlier instances. I attach much importance to the perfect fluidity of the blood, and the aseptic condition of all the instruments. In no case had our patients the slightest fever, rigor, or disturbance of any sort subsequent to the operation. Glass was purified by prolonged immersion in a solution of bichloride of mercury, metal in carbolic acid.

For introduction into the vein of the receiver, I use a short glass-tube, of the size of a No. 6 catheter, having a pen-shaped point. To its other end, made slightly bulbous, about two inches of india-rubber tubing is attached. A simple glass syringe, holding four ounces, whose nozzle fits the tubing, is perfectly effective. I keep up the temperature by surrounding it with boric lint, wrung out of hot water. A syringe which I had made with an outer glass envelope to hold warm water, I find rather cumbrous. A graduated glass vessel, kept floating in warm water, contains the solution of phosphate of soda, and receives the blood.

All are washed with aseptic water after removal from the antiseptic solution, and before being used.

In amputations, the most convenient vein is selected on the face of the stump, the glass point is inserted, and a catgut ligature put round it. While the process of ligaturing the arteries is going on, the blood is caught by one assistant, who adds the soda-

solution as required, and is slowly injected by another. There is no time wasted, and the amount put into the circulation is precisely proportioned to what the patient would otherwise have lost, *plus* what amount of saline solution the surgeon may think right and appropriate to the case.

In the case of pernicious anæmia to which I have referred, a vein in the arm of the blood-receiver was exposed, and under it a double thread of catgut was passed. I then drew the blood from the donor into the dish containing the phosphate of soda, with which it was gently mixed by means of a glass rod. While an assistant filled the syringe, I opened the exposed vein of the receiver, the lower thread of catgut being gently pulled upon to prevent bleeding. The tube was now inserted, the upper thread tied round it with one knot, and the lower definitely secured and cut short. The blood was next slowly injected, the india-rubber tubing being pinched when the syringe required to be refilled. The upper catgut was finally tied and cut short when the operation was completed, and the little wound was stitched up.

There is a limit to the rate of injection on each side. One may possibly take longer to inject than the blood will remain fluid, or one may inject too rapidly for the comfort of the patient. In amputation neither of these can easily happen; but in this case I committed both errors. This point, of course, involves the question as to how much phosphate of soda ought to be added, and as to the coagulating quality of the blood. The solution of phosphate of soda was of 5 per cent., and one part of the solution was added to three parts of blood. A slightly larger proportion is probably advisable, and was frequently used in the amputation cases.

The donors for the pernicious anæmia were healthy and powerful young students. One of them, Mr Hardyman, found before he was bled that his red corpuscles were largely above the average, and on that occasion six ounces and a half of blood were added to two ounces of soda-solution. I was obliged to stop before the last ounce was injected, because it showed signs of thickening in the dish, and it actually coagulated six or eight minutes afterwards.

On the next occasion, with the same donor, I hastened the operation considerably, in order to avoid this coagulation. The patient, however, had only received four ounces when she experienced so much distress from pain in the back and forcible cardiac action, that I ceased injecting. It was annoying to find that, by an error in compounding, the soda-solution had been made of double strength, and that the remaining blood had not coagulated half an hour afterwards.

Experience, in short, shows that in such a case, and with sufficient phosphate of soda, one may occupy at least twenty or thirty minutes in injecting; and that at a slow rate the patient will experience not the least discomfort. At the same time, the effect will vary with the condition of the patient. In one amputation, I

injected eight ounces in five minutes; in the hip, sixteen ounces in about fifteen minutes, without any disturbance. But in the case of pernicious anæmia, we had already by previous operations added considerably to the vascular contents, and the quantity of blood in the body was daily increasing, so that it is not astonishing that four ounces added to the blood in five minutes should produce unpleasant though evanescent symptoms. The more complete and rapid depletion has been, the more quickly and largely may repletion be effected.

One other observation has to be made. The process of re-injecting the patient's own blood is incompatible with the use of spray or irrigation during the operation. For myself, I am satisfied by experiment and from clinical experience that the spray does not kill micro-organisms in the air; and that in most cases the application of the germicide may safely be delayed till near the end of the operation. With pure hands and instruments, the risk from air is trifling, and it is not worth considering when a patient is in imminent danger from hæmorrhage and collapse.

Dr James said that Dr Duncan's experience of forcibly injecting the blood reminded him of some experiments done in Ludwig's laboratory, in which it was demonstrated that the addition to or abstraction from the amount of blood in an animal's body did not permanently alter the blood pressure. If the experiment were done slowly, the blood pressure had in a short time regained the normal. If it were done hurriedly, there was a danger of extravasation and an unsuccessful result. This suggested the question whether the blood used for transfusion in the case of primary amputation might not have been got in another way, by confining it in the limbs. If, for example, there were a pound of blood in each limb, it might be driven from there when the operation was over by means of Esmarch's bandages. The same effect might be got as was by the injection of blood into the vein.

Prof. Annandale, as one who had worked much at transfusion, considered Dr Duncan's paper of very great value. When Roussel brought out his method, he got his instrument, but found it much too complicated, and though he succeeded in two cases, in others he failed. Dr Duncan's method had the merit of simplicity. The operative details only required a little attention, and were most effective. A very important point was the using of the patient's own blood. Some of the saddest cases they had to deal with were those primary cases, in which very little blood was left in the body, and where applying bandages to the arms or leg was of little use.

Dr James said it was impossible to remove all the blood from the body before death. A considerable quantity of fluid would be left in the vessels and intercellular spaces, which might be used in the way he had suggested.

Dr Cotterill had seen transfusion done by many methods, direct and indirect. The operation as performed by the instruments of Roussel, Collin, Aveling, and others was uncertain, complicated, and unsafe; while by the indirect method there was the loss of blood consequent on defibrination. The highly unsatisfactory nature and results of the operation by the above methods had determined him to try the method recommended by Hicks, of adding phosphate of soda solution to the blood. He had employed this method some time ago in a case of gastric ulcer from which there had been profuse hæmorrhage; and although at the time of the operation the patient was almost in "articulo mortis," she rallied very well after the transfusion of about eight ounces of blood. The details of the operation were precisely similar to those employed by Dr Duncan, and the care and safety with which it was performed so struck him that he strongly recommended Dr Duncan to employ this method when about to operate on his case of pernicious anæmia. The operation was now devoid of the two chief risks, namely, those of introducing a clot or a large quantity of air into the bloodvessel. Dr Cotterill did not consider it a *sine quâ non* that the blood should be rendered aseptic, as the inherent vitality of the blood would be more than sufficient to take care of any organisms that might be introduced with the blood into the system. At the same time, it was of course wise to keep the wound in the vein, etc., free from septic infection.

Mr Miller said that Dr James's suggestion had already been carried out in practice. They were much indebted to Dr Duncan for bringing the details of this very simple and successful method of transfusing before them, and he hoped that when he published it he would go into the minutest particulars for the sake of those who had no opportunity of seeing the operation done. There were many little points that made for success or failure according as they were properly or improperly attended to.

Mr Bell said that these cases of primary amputation were very often fatal from another factor than loss of blood. In his last case there was comparatively little of that. The patient had been injured at Portobello Station. A tourniquet was at once put on by a man who had been trained in an ambulance class. It had acted admirably. But during the operation, and for twenty-four hours afterwards, his condition was a most anxious one. During the operation itself he was twice stopped, the chloroformist thinking the patient was dead. He appeared to suffer from what was called shock. What this condition was they did not know, but he believed that in many of the cases a clot formed in the heart and aorta, and if this persisted the patient died. In such cases he did not think transfusion would help, but in those where loss of blood was the cause of the patient's condition it would, and they were much indebted to Dr Duncan for having brought the details of this simple method before them.

Mr Hare asked if any use could be made in transfusion of the extract of leech which Dr Haycraft had discovered to be capable of retarding coagulation for a considerable time. He had repeated Dr Haycraft's experiment, and with six minims of a watery extract had kept two ounces of blood fluid for about ten hours. This extract might be of use in preventing such coagulation as Mr Bell had referred to. There was doubtless an advantage in injecting the blood in an aseptic condition, but it was not absolutely necessary, as large numbers of *bacterium termo* had been introduced repeatedly into the circulation of living animals without producing ill effects. The vitality of the blood seemed to give it strong antiseptic qualities.

The President said he had received a communication from a former pupil in South America, in which he stated that the people in his neighbourhood had great faith in drinking the blood of living animals. Some of them died after such draughts, and the stomach and duodenum had been found full of blood-clot.

Dr Duncan said that shock and loss of blood very often complicated each other in primary cases. He was not prepared to enter on the question of the nature of shock, but he thought it might not be far removed from loss of blood, a bleeding into those abdominal veins to which Dr James had referred. He had no doubt that they would be able to save life in many cases by transfusion. As to the plan or method by which it was to be done, that was subject to experiment and improvement in the future. Operators would require to be careful as to the saline solutions that might be used to keep the blood fluid. Some of these, for example the nitrates, were absolutely lethal. No doubt Drs Cotterill and Hare were correct in their statements that the entrance of a few germs into the circulation did not much matter, but Chauveau's experiments showed the danger if there were local injury. The entrance of air, except in large quantity, did not do harm. It was of importance that the instruments should be aseptic. In most of the experiments which had been made, the operation had been followed by a rigor, and some even considered the rigor as evidence of a satisfactory injection. It might, however, be that the rigor was due to the entrance of small coagula. In his cases it had not followed, because his method avoids both septicity and coagula. He injected the blood at the temperature of the body.

Meeting IV.—January 6, 1886.

Dr Duncan, *Vice-President, in the Chair.*

I. Election of New Members.

The following gentlemen were elected Ordinary Members of the Society:—Charles Kennedy, M.D.; William Gayton, M.D., M.R.C.P. Edin., London; Reginald E. Horsley, M.B., C.M.

II. Exhibition of Patient.

Dr Philip showed a case of urticaria, presenting one or two characters of interest. The eruption had developed acutely, with no very evident cause, the patient going to bed well and finding, when he awoke in the morning, the characteristic wheals widely distributed. They were present on the back of the thighs, on the buttocks, and the lower part of the trunk posteriorly. They had remained out for ten or twelve days, during which time the patient suffered acutely, and sleep was impossible. In addition, towards the upper limit of the eruption on the left side, a number of vesicles and bullæ had developed, so that in part the case presented an ecthymatous appearance, and suggested the possibility either of the conditions being one of erythema exsudativum multiforme, or of the existence of a concurrent herpes zoster. The history, general distribution, and other appearances were opposed to either of these views. It must be regarded as an urticaria, assuming locally those intense characters. These coupled with its remarkable persistency, would, in the more formal terminology of some of the schools, lead to its classification as *Urticaria perstans vesiculosa et bullosa.*

III. Exhibition of Instruments.

1. *Dr Nasmyth*, Cowdenbeath, showed a new form of box-splint. It was intended to overcome the difficulty of treating oblique fracture of the leg. This was done by means of a rack at the foot, to which plaster straps were attached for application below the seat of fracture, and counter-extension was made by straps attached to the top of the splint. He had found it also useful in the treatment of compound fracture of the leg.

2. *Dr Foulis* showed (*a.*) A device whereby the instrument for aseptic catheterization, shown at two previous meetings of the Society, could be applied to any catheter. (*b.*) An instrument, made on the same principle as his aseptic catheter, for washing out the stomach. (*c.*) An aseptic canula, intended to obviate the objection to the ordinary aspirator when plugging occurred. A

stream of an antiseptic fluid was made to pass through the canula, while a blunt trocar was inserted to clear it.

Dr Skene Keith was interested in the canula, but thought it was too complicated to come into general use. The apparatus used by his father for many years for tapping the abdomen was much simpler. A trocar and canula was inserted, the trocar withdrawn, and the fluid rushed out. The tube from the aspirating bottle was at once attached to it. It occasionally happened that the canula became blocked, but this was overcome by simply taking off the tube and clearing the canula with the trocar. He had never seen a bad result follow.

Dr Foulis said Dr Keith might do so in the case of the abdomen, but he defied any man to do it to the pleura without introducing sepsis.

Dr Shand said that in the days before antiseptics were heard of he did exactly what Dr Foulis objected to. He tapped the pleura on several occasions, using a new well-made and clean stomach pump, and the results were most satisfactory.

Dr Troup said that he had several times tapped the pleura without using those special precautions that Dr Foulis insisted on. In some of the cases the fluid was purulent. The results were highly satisfactory, and the patients were alive to this day. It had also happened to him one morning on riding into a village to be called to see a child just big enough to reach up to a kitchen dresser, open it, and abstract some laudanum, of which it swallowed one ounce. He had a catheter with him, which he passed into the stomach and washed it out, inverting the child to get the siphon action. The case did well.

Mr Joseph Bell hoped Dr Foulis would not call the aspirator he had on the table Dieulafoy's, if he intended to publish an account of his instrument. The aspirator of Dieulafoy had not the objection to which Dr Foulis alluded when plugging occurred, but by using its back action any plug was easily and safely dislodged.

IV. Exhibition of Pathological Specimens.

1. *Mr A. G. Miller* showed the parts from a HIP-JOINT AMPUTATION, in which transfusion had been employed, and read the following notes of the case:—

G. T., æt. 18. Admitted 5th December to Ward XVI., Royal Infirmary, with strumous disease of both hips, left knee and left elbow, and a large abscess connected with the left hip. He was very weak and anæmic.

History. — Had rheumatic fever eighteen months ago, also erysipelas. Was under Dr Duncan's care in Royal Infirmary nine months ago for disease of right hip.

Present Condition.—Right hip improving, but extension still necessary. Left knee and elbow affected with synovial degenera-

tion. Left hip extensively diseased, a large abscess communicating with the joint.

The abscess was freely opened and drained on the 8th December, which gave some relief. But as the patient still suffered great pain, and there seemed no prospect of ultimate recovery, or even much improvement, amputation of the left leg at the hip-joint was suggested. This was agreed to by the parents and the lad himself, the risk from the operation having been fully explained.

Amputation was performed on the 18th December as follows (Dr Duncan having kindly undertaken the important part of collecting the blood that might flow during the operation and re-injecting it):—

An elastic bandage having been applied from the toes to the middle of the thigh, and a powerful elastic tourniquet at the groin, a rapid circular cut was made right down to the bone in the upper third of the thigh and the femur sawn through. A gush of blood took place, estimated at about four ounces, which was all caught by Dr Duncan in a vessel containing a solution of phosphate of soda. The femoral artery and some smaller vessels were then tied, and the tourniquet removed. After this a few more vessels required ligaturing, and a few ounces of blood escaped, which, however, Dr Duncan managed to collect and injected along with the previous quantity into the deep femoral vein. By an incision on the outer side of the thigh the head of the femur was then dissected out. This part of the operation was accompanied by more bleeding than usual (five or six vessels requiring ligaturing) on account of the great vascularity consequent on the extensive amount of disease. The wound was thoroughly washed out with corrosive sublimate lotion, dusted with iodoform, brought together with four button sutures, and a few superficial ones, and the stump wrapped up in sublimated wool. After the operation the patient suffered from no shock whatever, nor had he any depression of temperature. For the first few days he was flushed, and had a fuller pulse than before the operation, but he had no rise of temperature. He has made an uninterruptedly good recovery, and is now (nearly three weeks after the operation) able to sit up in bed. The wound has always been dressed under protection of the spray, and is now quite healed as regards the deeper parts, there being only a superficial granulating surface along the line of the incisions.

The highest temperature recorded was 100°·3. There was slight hæmaturia for two days. The day after the operation the number of his corpuscles was four and a half millions.

The case is one of special interest, as illustrating the advantage of Dr Duncan's method of blood injection which he described at a recent meeting of this Society.

The patient being in a very weak and anæmic condition before the operation, and the hæmorrhage during the operation having

been greater than usual owing to the great vascularity of the parts from the extensive disease, it is very unlikely that he would have survived the shock of the operation had the greater part of the blood not been re-injected.

Dr Duncan, who watched the hæmorrhage, and measured the blood collected and re-injected, calculates that the patient had an ultimate gain of blood after the operation. He estimates it thus:—

There was pressed back into the general circulation by the elastic bandage, say ℥v.; re-injected of blood measured, ℥xj.; lost in sponges and sawdust, say ℥iij.; lost from destruction of corpuscles, say ℥j.; net gain of blood, say ℥j. But to this must be added lymph from leg, say ℥v.; solution, ℥iv. And also a diminished demand on the general circulation on account of the leg having been removed.

Prof. Chiene regarded this method of transfusion as one of the most important of the later improvements in surgery. It was evident that in proportion to the body weight the patient had more blood in him after than before the operation. He had it in fluid form, which was of very great importance. It was fluid that many of these patients wanted, there being usually so little fluid circulating that the heart could not contract upon it. He had been interested to observe in the course of some experiments he had made that it was impossible to abstract all the blood from the body of an animal by ordinary bleeding. If an animal were bled to death a large quantity of blood was always left in the abdominal veins which cannot be abstracted. He wished to ask if the phosphate of soda solution was aseptic.

Dr Duncan said that the solution was made with boiled distilled water. It was, however, impossible to use the spray, as the mixture of carbolic coagulated the blood.

Dr Foulis asked if this solution of phosphate of soda, or of some analogous salt, might not be used in medicine to prevent the coagulation which occurred as a result of pneumonic disease. It was a wonderful fact in physiology that the blood did not coagulate in the bloodvessels until it flowed into the area of the injured tissue. Could the mechanical plugging of bloodvessels, caused by coagulation of the blood, be prevented by adding to the blood a certain percentage of phosphate of soda or some other salt?

2. *Dr Symington* exhibited a specimen of DISEASE OF THE VESICULÆ SEMINALES AND TESTICLES. The epididymis on the right side was much enlarged, and on section was seen to be converted into a caseous looking mass. The corresponding vas deferens showed no traces of disease. The pelvis was divided by a coronal section, passing through the bladder, vesiculæ seminales, and second part of rectum. The right vesiculæ seminalis was enlarged, so that on examination per rectum it could have been felt as a rounded

mass. On section its ducts were found greatly distended, and filled with caseous material. The left testicle and its epididymis appeared to be healthy, but the cavity of the tunica vaginalis was partly obliterated by adhesions. The left vesicula seminalis was atrophied, and its cavity obliterated.

V. Original Communications.

1. CASES OF OVARIOTOMY.

By Skene Keith, M.B., F.R.C.S. Ed.

From my first fifty cases of ovariotomy I have selected several, which present special points of interest, either in the diagnosis, in the steps of the operation, or in the after-treatment. Details of an ordinary case of ovariotomy are without interest and are only wearisome; they are usually written by gentlemen who appear to think like an American friend, who had come to the conclusion that all his cases were "mortal bad." The two fatal cases of the fifty, and those are usually the most interesting, though often least heard of, have already been published in the *British Medical Journal* of 31st October 1885.

Mrs M., age 38, the mother of eight children, said that she first noticed a lump in the abdomen a year ago. Since that time it had slowly increased in size. An ovarian tumour, with probably posterior adhesions, was diagnosed, and it was removed on 10th June 1881. It was my first ovariotomy. Instead of the cyst being free in front, as I had expected, I found that it was closely adherent to the peritoneum, which was greatly thickened and almost as firm as cartilage; and, in fact, every morsel of the tumour was adherent to something—parietes, omentum, or bowel. After separating and tying with fine silk over thirty bleeding pieces of adhesion I reached the pedicle, which was tightly twisted, and apparently did not contain any bloodvessels. A single loop of silk was tied round it to make sure that it would not bleed. The abdominal cavity was well sponged and a glass drainage-tube, reaching from the lower angle of the wound to the bottom of Douglas's pouch, was left in position. The interior of the cyst was almost in a state of gangrene. The twisting of the pedicle gave the reason for this, and also for the slow growth of the tumour. Its weight was 8 pounds.

Some months after going home Mrs M. was delivered of a fully matured male child. While under treatment here it was not suspected that she was pregnant, as she had menstruated a few days before leaving home. No special care was taken during the operation to save the uterus, which was a good deal pushed about by the sponging. In this case the pedicle had become twisted without causing any disturbance. When speaking of twisting of

the pedicle, of course the slight rotation, which is met with in many cases, is not meant, but only when there has been interference with the circulation through the pedicle to the tumour.

W. B., age 24, says that five years ago she had an attack of severe abdominal pain, lasting for two weeks, and then observed a tumour in the abdomen. There had been no menstrual flow for ten months before this time, and since then the periods have been very irregular, sometimes appearing every fortnight. The tumour has increased very slowly, and there have been two other attacks of pain resembling the first one, though the pain was not so severe. A round, firm tumour was felt extending to 2 inches above the umbilicus, adherent probably on the right side. In the pelvis the uterus was felt to be small, with the body lying backwards. The history, and abdominal examination, pointed unmistakably to the tumour being uterine, but the pelvic condition made it clear that the growth was ovarian. At the operation on 7th March 1883, the tumour was found to have extensive friable connexions to the omentum. There was no pedicle. It had been entirely twisted off, and its remains were seen adhering to the sac. Although the tumour had been growing for at least five years, its weight was only 8½ lbs. This was a typical history of a twisted pedicle; an attack of horrible pain followed by slow increase in size of the growth. The uterus was retroverted, and the right ovary was healthy. Unfortunately the specimen was not preserved, several other cases of twisted pedicle having been met with about the same time.

Mrs M., age 34, had noticed a hard lump in the right side three months before she was sent to me. In June of last year there was a firm, irregular tumour in the right side, closely connected with the side of the uterus. In a month it had grown considerably, and a distinct pedicle could be felt, reaching from it to the uterus. In August it was fully twice the size it had been in June, and she had become pregnant. As experience has shown that the worst kind of adhesion is often met with where there has been one or more pregnancies along with an ovarian tumour, and as there does not appear to be any risk of causing abortion where there is an early pregnancy of three or four months, the tumour was removed without delay. It was a dermoid, and there were only slight posterior adhesions.

Mrs K., age 23, was delivered of her third child ten weeks before operation. No distinct tumour was noticed for some weeks after the birth, though the abdomen was thought to be large. At the operation the whole anterior surface of the tumour was found to be adherent. Probably the peritoneum had become directly connected to the cyst wall, and the growth of the uterus had stretched this connexion to the length of an inch. This had

allowed of free movement of the parietes over the tumour, leading one to suppose that there were no adhesions in front. Thirteen months after the operation Mrs K. introduced her fourth baby to the world.

Mrs K., age 43, first noticed a hard lump high up in the left side two years ago; she had never had much pain. Urine contained 1-6th albumen on boiling and adding nitric acid.

15*th November* 1884.—Operation in the forenoon. The omentum, composed mainly of bloodvessels and connective tissue, with little fat, was of great size, and almost made a sac for the tumour, which weighed 34 lbs. A large part of it had to be removed. The second ovary was enlarged and adherent to the pelvis, and was also taken away. The albumen disappeared at once after the operation.

Mrs B., age 50, was sent into the Infirmary late one evening; she was very breathless, and had to sit in a chair before the fire all night. There was little urine, containing a half albumen. The abdomen was immense, and there was tremendous œdema of the wall. There was evidently a large quantity of free fluid in the peritoneum whatever else there might be. The history was as follows:—Four years before, a tumour was noticed in the left side, and was allowed to increase in size for three years, when she consulted a herbalist, who prescribed a bottle and some pills, which were taken for six weeks. At the end of that time she was much reduced in size, but says that she was almost dead from the purging and diuresis. Ten years ago, says that she had an attack of inflammation of the left kidney, lasting nine weeks.

Next day I tapped the abdomen, removing 52 lbs. weight of viscid, yellow fluid. I had to put the trocar in well above the umbilicus to make sure of its reaching the abdomen cavity on account of the œdema. Two tumours could then be felt—the larger on the right, the smaller on the left. In three days the abdomen began to refill, and the albumen had almost disappeared from the urine. Two non-adherent tumours were removed on 8th December 1884. Their weight, along with the free fluid, came to 89½ lbs.

Mrs W., age 26, came to Edinburgh in June 1884. A year before, she had consulted Dr Whiteford of Greenock about an enlargement of the abdomen. Dr Whiteford advised her to go to Edinburgh; but, as the tumour did not trouble her at all, she delayed for twelve months. At no time since the swelling was first noticed has there been any abdominal pain, nor has there been any change in the menstruation. On examination, the abdomen was found to be uniformly distended by a smooth multilocular tumour, reaching up to the ribs. In front there were no adhesions, but in the pelvis the condition was doubtful, as part of the

tumour was to be felt jammed low down on the left side of the uterus. However, the uterus was fairly movable.

On the 28th June I made an incision down to the tumour and emptied the largest cyst. This did not permit me to draw the tumour through the wound. I took out the trocar, enlarged the opening in the cyst, and broke up with the hand numbers of small cysts. I was then enabled to draw forwards the tumour sufficiently to see that the whole of its upper surface was attached to small intestine. This determined me to attempt to turn the tumour out from below. It was, however, so closely connected to the uterus, and had so extensively opened up the folds of the left broad ligament, that nothing in the shape of a pedicle could be reached. There was nothing for it, then, but to separate the adherent bowel from above. This I did, and found that the whole posterior surface of the tumour was covered by it. When this separation was almost completed I came on a round, whitish cord, about the thickness of the fourth finger. This was fortunately not very closely adherent, and was easily detached from the tumour. It was the left ureter. The tumour was too intimately connected to the uterus to allow of its separation, so after detaching the left broad ligament as far as possible, I was able to put a large clamp almost below the tumour, including a considerable part of the uterus in its grasp. Bleeding points, on which forceps had been left, were now tied with fine silk or catgut, and as sponges from the pelvis, both behind and in front of the uterus, came up almost dry, no drainage-tube was put in. The wound was carefully closed round the stump, and gauze, soaked in a solution of carbolic acid and glycerine 1 to 8, packed round the clamp. The tissue beyond the clamp was covered by a saturated solution of perchloride of iron in glycerine, and iodoform freely sprinkled over the whole. The weight of the tumour was 16 lbs. Time taken to operation, 58 minutes.

In the afternoon and evening the patient was fairly well. Temp., 101°·4; pulse, 120. At nine o'clock next morning she looked very ill. There was a total want of expression; the face looked thin and gray. The temp. was 102°·8; pulse, 136; respiration, 40, shallow, with occasional sighing. She complained greatly of a feeling of tightness across the chest. The abdomen was very flat. There was no movement of intestines and no sickness.

11 o'clock.—Pulse, 140. An enema of beef juice with ℥ss. whisky was given, and ordered to be repeated every two hours.

2 P.M.—Looked as if she would not live twelve hours. The flesh seemed simply to be flying, not only from off her face, but also from the whole body. Unfortunately Dr Keith was out of town. She constantly complained that she was about to faint, and stimulants did not seem to revive her. I ordered six grains quinine by enema.

At 6 o'clock the patient had been asleep for an hour, and flatus had passed freely. She looked slightly better. Temp., 101°·2;

pulse, 144. The feeling of tightness across the chest was gone, and the attacks of faintness did not come so often.

10 P.M.—Looked much better; temp., 101°·2; pulse, 138; 31 oz. urine since operation. There was after this no cause for anxiety. On the eleventh day I removed the clamp, opened up the stump, and found that there was a cavity barely an inch in depth. This cavity I filled with iodoform, and it slowly cicatrized from the bottom. The patient went back to Greenock forty-four days after operation, and on examining the uterus it was hardly possible to believe that it had been fixed in the wound, it was so movable.

The one interesting point about this case is the marvellous condition of shock which came on sixteen hours after the operation. It appears to me that the sympathetic nervous system had been injured or interfered with in some way, as was shown by the total absence of all intestinal movement, the feeling of tightness across the chest, and also probably by the repeated attacks of faintness coming on at one time every few minutes. Even in the worst cases of septicæmia I have never seen anything approaching to the rapidity with which the flesh disappeared from off this patient's body, for it was not only the face, but also the legs and arms which became emaciated.

A. M., age 22, has been aware of the presence of a swelling in the abdomen for fourteen months. For nine months after this was first noticed she was much troubled with vomiting occurring after meals. This finally ceased when she gave up wearing her stays. She has never been a strong girl; has always cold feet and hands, and a few months ago the left ankle swelled. The urine appeared to be normal, sp. gr. 1022. There was one large single cyst, and the possibility of its being a cyst of the broad ligament was thought of, but the history and pelvic examination was against this diagnosis.

At the operation, on 26th August 1884, the tumour was found to be a broad ligament cyst.

Second day, 6.30 P.M.—Patient complains of headache. Temp., 101°·6; pulse, 120. 41 oz. urine up till now; 10 oz. passed containing a trace of albumen.

8.30.—Temp., 104°; ice to head.

10.30.—Temp., 102°·8; pulse, 128; resp., 30. Nutritive enemata to be given every two hours.

Third day, 2 A.M.—Urine, 6 oz.; albumen, 1-6th.

4.30.—Urine, 6 oz.; albumen, 1-5th, with a trace of blood.

1 P.M.—Urine, 6 oz.; albumen, 1-4th; slight increase in the amount of blood; temp., 101°·4; pulse, 124.

9 P.M.—Temp., 103°; pulse, 150. Skin hot and dry; no decrease in the amount of albumen; face puffy. A ninth of a grain of nitrate of pilocarpine was injected and the ice taken off. In fifteen

minutes the whole body was bathed in perspiration. Albumen, 1-3rd.

At midnight the pulse was very weak at 144 ; temp., 101°.

Next morning patient was decidedly better. Temp., 100°·4 ; pulse, 140. Less albumen ; no blood. The pulse came below 100 on the eighth day. There was no albumen on the seventeenth, and patient went home on the twenty-ninth day.

After the operation a remark was made that the sponges, which had been soaked in a two per cent. solution of phenol, had been used very wet, and I believe that there must have been more of the acid left in the abdominal cavity than the kidneys could get rid of without irritation. This case is a strong argument in favour of tapping every case of broad ligament cyst. Had this been done, all risk, trouble, and anxiety would have been avoided.

Mrs K., age 46, had been aware of the presence of something in the abdomen for two or three years. This something had much the appearance of a cyst of the broad ligament, but in the pelvis a hard mass the size of a hen's egg was to be felt.

Operation was on 18th May 1885. After emptying the cyst, which was a parovarian one, I found that it could not be drawn out of the abdomen, as it had opened up the right broad ligament, extending outwards to the ilium and deep down into the pelvis. The solid part turned out to be a small dermoid ovarian tumour, and was connected to the posterior layer of the broad ligament, the anterior layer being in front of the cyst. I enucleated down to the bottom of the pelvis, getting lower than the level of the external os uteri ; next I removed a large part of the much hypertrophied broad ligament, and along with it the ovarian tumour, and fixed the rest of the ligament outside in a clamp, stitching the wound closely round it.

For six days patient knew nothing. The temperature ranged from 102° to 104°·5 ; pulse about 110. The clamp was taken off on the third day, and a drainage-tube passed into the pelvis. During the second week there was free suppuration from the right broad ligament.

Probably the best thing to have done with the broad ligament, instead of fixing it in a clamp, would have been to have ligatured its edge in five or six pieces, and allowed it to fall back into the abdomen. The objection to using the cautery was the possibility of oozing going on behind, making a thrombus and separating the cauterized edges.

This case also shows the advantage of tapping broad ligament tumours. Had it been a simple parovarian tumour uncomplicated by an ovarian one, the difficulty and risk would have been the same, while tapping would probably have resulted in cure.

J. S., age 21, was sent to the Infirmary from Aberdeenshire,

with a rapidly growing ovarian tumour, which had only been noticed four months before.

The tumour was multilocular, and had raised the ribs and sternum. The whole abdominal wall was œdematous. The tumour was adherent in front; the pelvis was full of it, retroverting the uterus. Two cysts were emptied to give relief, and to allow the œdema to disappear. The specific gravity of the urine was 1026.

The operation was on the 16th June. After breaking down the tumour, I had to separate adhesion from the whole anterior surface, and as high up as the border of the liver. The peritoneum was very vascular, and the bleeding was stopped partly by ligatures and partly by pressure of sponges from within. A drainage-tube was left in, as there was considerable hæmorrhage going on, high up about the liver. There was a good deal of shock, and the pulse was 128 immediately after the operation. At night she looked and felt weak, and enemata were begun. The temperature rose to 103°·4. By morning pulse was 145; temp., 101°·4. She was very weak. She was told that she might have whisky as often as she asked for it, and in the next twenty-four hours had 22 oz., which was, perhaps, rather too much; however, she would have died without a large quantity. The patient did not get on very well, and on the fifth day, as the face was slightly puffy, the urine was examined and found to contain fully a half albumen. The amount of stimulants was reduced, the loins poulticed, and a large dose of salts given, which moved the bowels three times by night, with the result that the pulse fell from 136 to 118, and the temperature from 103° to 101°·8.

On the seventh day I took out the drainage-tube to allow the girl to lie on her side, as there was unfortunately a slough on her back, the only misfortune of the kind which we had in Ward XIX. of the Infirmary in six years.

On the evening of the ninth day the temperature was 102°·8; pulse, 120. Next day both were under 100, and after that there was no trouble. During those first nine days the temperature was taken every two or three hours, and only ten times was it under 101°. The pulse was nine times counted under 125 during the same time.

Where nothing has been said in this paper about the convalescence the patient did well. This has avoided, as much as possible, repetition and wearisome details.

Prof. Simpson congratulated Dr Keith on the success of his first fifty cases of ovariotomy. Several of the cases he had brought before them were of great interest, particularly those in which torsion of the pedicle had occurred. Most of them illustrated a great fertility of resource in the operating, and in the management

of the cases afterwards. They were all proud of the reputation Dr Thomas Keith had won by his success in this operation, and were delighted to see the son following his father's footsteps. The paper which Dr Skene Keith had read—and read just a little too rapidly for the members of the Society to get the full benefit of it—seemed to him a very valuable one. Perhaps its value might have been increased if Dr Keith had offered some observations as to the peculiar conditions that had come under his notice. For example, he should like to have heard a little more regarding the torsion of the pedicle. Mr Lawson Tait's view, that this was due to the action of the rectum, would explain the last case he (Prof. Simpson) had met with. In that case a right-sided ovarian tumour had had its pedicle twisted as if its left border had been turned forward and to the right, which was the direction the twist would take under the pressure of the sigmoid flexure of the colon and rectum on the back of the tumour.

Mr A. G. Miller said the general impression he had derived from hearing those cases was a confirmation of the opinion he had long held that the peritoneal cavity stood a good deal of rough handling, and that abdominal surgery was not a good test of antiseptics. If the abdominal surgeon were to treat a stump in the same way as a peritoneum was usually treated, the stump would go wrong to a dead certainty. Sepsis would assuredly follow. Another thing that impressed him was how near to death many of the patients seemed to be, and yet they recovered.

Dr Black said he had seen several ovariotomies, by different operators, before the days of antiseptics. They were almost all fatal, though every precaution appeared to have been taken, excepting that the operations were done in a crowded theatre, before large audiences, which probably had a bad effect on the patient.

Mr Cathcart asked if the explanation of the power of introducing septic organisms with impunity was not dependent on the rapidity with which the peritoneum absorbed? If a certain limited quantity of putrid material were injected into the peritoneal cavity it did no harm, but if a quantity which exceeds the absorbing power of the area on which it lay were injected, then septic peritonitis followed.

Dr Duncan asked if it were not the case that if an aseptic fluid were injected into the peritoneum in a sufficiently large quantity, bacteria would develop and septic peritonitis result? He thought that was one of Burdon-Sanderson's experiments.

Dr Keith, in reply, said he could not answer Prof. Simpson's question about the twisting of the pedicle, because in the anxiety to get the operation done quickly there was not time to notice such a detail. To be accurate it would be necessary to take a note at the moment of observation, because on one occasion when

they had remarked the direction in which the twisting had taken place those present found themselves after the operation unable to agree upon it, some saying it was from right to left, others that it was from left to right. He rather thought Mr Miller had forgotten that to get into the peritoneal cavity one had to make a wound which was occasionally a pretty extensive one, and had to bear as rough a handling as the peritoneal cavity. If septicæmia did not occur through the peritoneum it might through this wound. Mr Miller was right about the nearness to death of many of the cases. The first day or two were the worst for the patients. After that they were almost always advancing to convalescence if they were to get better.

2. NOTES ON THE POSITION OF THE FLUID IN CASES OF PLEURITIC EFFUSION.

By J. Symington, M.D., F.R.C.S. Ed., F.R.S.E., M.R.C.S. Eng., Lecturer on Anatomy, School of Medicine, Edinburgh.

If fluid be effused into any of the large serous cavities, such as the pleural, pericardial, or peritoneal, it is obvious that it must produce some alteration in the anatomical relations of the neighbouring structures. The situations in which the fluid will tend to collect, and the nature and extent of the displacement of the neighbouring organs, are points of considerable practical importance, both in diagnosis and in treatment. The subject does not, however, appear to have received the attention it deserves—indeed, in the majority of works on medical diagnosis it is almost entirely ignored. Last winter session Professor Grainger Stewart read a paper before this Society, "On a Case of Tapping of the Pericardium, and on Tapping of the Pleura in the Treatment of Cardiac Disease," which gave rise to a very interesting discussion. I was, unfortunately, not able to be present on that occasion; but, after a perusal of the report of the meeting in our Transactions, I must say that this aspect of the subject appeared to me to have been somewhat overlooked. The information derived from the ordinary physical signs, and the usual mode of conducting a post-mortem examination, do not afford a complete and satisfactory knowledge of the position and relations of the fluid. In addition to the theoretical deductions that may be drawn from the application of well-established physical laws, important information may be derived from experimental injections of fluids that afterwards solidify, or by frozen sections in which one or more of the serous cavities are naturally distended with fluid. J. J. Peyrot,[1] Powell,[2]

[1] *Etude expérimentale et clinique sur le thorax des pleurétiques et sur la Pleurotomie.* Paris, 1876.

[2] "On Some Effects of Lung Elasticity in Health and Disease," *Med. and Chirurg. Transactions of London*, vol. lix.

Garland,[1] Pirogoff,[2] and others have contributed to our knowledge of this subject, yet there are several points that still require elucidation.

Garland suspended dogs by the head, and injected into their pleural cavities plaster of Paris and cocoa butter, so as to obtain models of the shape of the pleuritic effusion. He found that the fluid collected between the diaphragm and the lungs, and the line of dulness, corresponding to the juncture of the fluid and the base of the lung, was S shaped, being nearly identical with that described by Calvin Ellis in the human subject.

So far as I am aware, the only author who has published drawings of sections of the bodies of patients who have died with fluid in one or more of their serous cavities is Pirogoff; but, while some of his plates are very valuable, many of them are too rough and diagrammatic to be of much use.

The results obtained by the injection of such substances as plaster of Paris or cocoa butter into normal empty serous cavities are obviously liable to various sources of fallacy. The material is poured into the cavity much more rapidly than in an ordinary effusion, and the fluid is of a different specific gravity. These circumstances may have an important influence upon the position assumed by the neighbouring organs.

Frozen sections, in cases of natural effusion, are likely to give much more reliable results; but, except in places where bodies are plentiful and the climate a cold one, its practical application is attended with considerable difficulty.

In the course of an investigation into the topographical anatomy of the child, I have made frozen sections of the bodies of several subjects in which the pleural cavities were found to contain some serous effusion. Although my specimens are few in number, and were not prepared with the object of determining the position and relations of the pleuritic fluid, I have ventured to bring them before this Society, in the hope that they may direct attention to these questions.

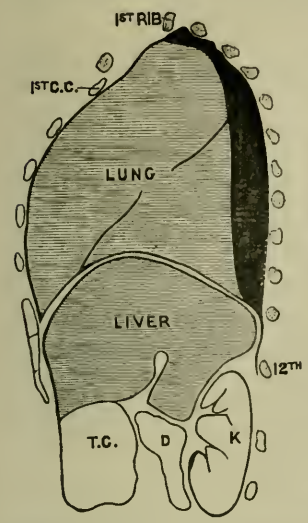
In all the cases to which I shall refer the entire body was frozen, the subject having been previously placed on its back in a horizontal position. In two instances the body was divided by several sagittal sections; in the others the cuts were made in a horizontal plane. The sections were traced, embedded in plaster of Paris, and hardened in spirit.

The woodcut is from a drawing of a sagittal section, one inch to the right of the mesial plane, of a male child aged about six years. The exposed viscera—lung, liver, kidney, supra-renal capsule, etc. —were apparently healthy. The pleuritic fluid had collected behind the lung so as to separate its posterior border from the

[1] "Some Experiments on the Curved Line of Dulness in Pleuritic Effusion," *Boston Med. and Surgical Journal*, 1874.

[2] *Anatome Topographica.* Petropoli, 1859.

ribs for about five-eighths of an inch; but the lung was in close contact with the anterior chest-wall and diaphragm. The fluid did not present a horizontal level along the whole extent of the pleural cavity. Thus at the upper part of the chest the fluid arched forwards above the apex of the lung, while below the fluid had not penetrated into the supplemental space, so that from the eleventh to a little below the twelfth rib, a distance of about an inch, the costal and diaphragmatic pleuræ were in close contact. A similar section was made to the left of the mesial plane, and the left pleural cavity was found partly obliterated by adhesions.



In another subject, that of a girl aged 13 years, sagittal sections were made 2 inches to the right and left of the mesial plane, and both pleural cavities were found to contain serous effusion. On the right side the fluid behind the lung was about 1 inch in depth, but from the tenth to the twelfth rib the costal and diaphragmatic pleuræ were in contact. The length of the supplemental pleural cavity was $2\frac{1}{2}$ inches. On the left side the position of the fluid was similar to that on the right, except that the supplemental pleural cavity was rather shorter. In horizontal sections of the thorax, such as I show in this drawing, the fluid presented a semilunar form. It was deepest behind the posterior border of the lung, but extended forwards a short distance on each side of the lung.

These sections confirm the general opinion that fluid in the pleural cavity tends to gravitate into the most dependent position, and the lung to float upon it. They support the views of Garland that the fluid does not maintain a horizontal level for all positions of the body, but that the shape of the fluid is modified by the lung. The lung is not altered in shape, although reduced in size. This is shown by the way in which the fluid extended forwards above the apex of the lung in the sagittal sections, and its semilunar form in the horizontal ones.

The non-extension of the fluid into the supplemental pleural space is an interesting fact, and one that I have not found any reference to in medical works. It could not be determined by percussion, on account of the presence of the liver on the right side and the spleen and kidneys on the left. It is worthy of notice as showing the difficulties connected with the plan of opening into and draining a pleuritic fluid from the lower part of the pleural cavity.

I believe that the results obtained by these sections are in accordance with what one would be led to expect from a study of the physical problems connected with the accumulation of fluid in the pleural cavity. The parietal and visceral layers of the pleura are kept in close contact by atmospheric pressure, and the lungs are maintained in a distended condition by the same force. As fluid collects in the pleural cavity the lung collapses, and the fluid tends to gravitate into the lowest part, as its specific gravity is greater than that of the lung. All parts of the lung are not equally compressible, or, as Garland puts it, the "retractile force" is unequally distributed over the lung, so that the fluid does not maintain a uniformly horizontal level, but is modified by the lung.

If air be freely admitted into the pleural cavity the lung usually collapses to about a third of its normal size, and it is extremely probable that the lung is readily compressed even though the fluid be poured out under a very low pressure. We should, therefore, not expect that it would force its way into the supplemental pleural cavity, and displace such organs as the liver or spleen, until the lung had almost entirely collapsed. It is difficult to determine how soon it would do so in the erect position of the body; but I am inclined to believe that it would not open up the supplemental cavity until it had produced considerable compression of the lung.

Dr James Ritchie said that Dr Symington's communication was a valuable as well as an interesting one. He had demonstrated that the upper level of pleuritic effusions was not a horizontal plane. Certain clinical features had led them to suspect this. On examining the back of the thorax in cases of effusion the breath sounds were heard at a lower level, near the spinal column, than further from it, showing the presence of less fluid in the former situation. At the upper level of the fluid it was found that the changes in both percussion and auscultation were not abrupt, and the ægophonic vocal resonance met with in such cases was explained on the theory that there was a thinner layer of fluid at the upper limit than further down. Dr Symington had concluded that the fluid did not reach the lowest part of the pleural cavity, but that the two surfaces of the pleura were there in contact, but Dr Ritchie doubted if Dr Symington's illustrations were a correct representation of the condition during life. In his case the lung was collapsed, or at least in a state of more complete expiration than would ever be the case during life, and the diaphragmatic and costal pleuræ would never during life be in contact to so great an extent.

Dr Shand had had a case under his care in which during a course of phthisis the patient died of an intercurrent attack of pleuro-pneumonia. The post-mortem examination showed the lung

exactly as it appeared in one of Dr Symington's illustrations. As confirmatory of what he said regarding the position of the fluid, he mentioned a case in which he had tapped two ribs below the axilla. The fluid flowed splendidly. Nothing could be more successful. There floated something on the top which, on examining more closely, he found to be a piece of adventitious membrane.

Dr W. Russell said that the absence of fluid from the supplementary pleural sinus was not in accordance with the observations which had been made by others. The fluid had been described as gravitating and finding its way there in the first place. In some of the recorded observations the experiments were made on living animals, and it was found that the position of the fluid depended on the position in which the animal operated on had been kept, and when in a suitable position the fluid always gravitated into this supplementary pleural sinus. It would be a matter of importance if Dr Symington extended his investigations to the position of the heart during the presence of fluid in the pericardium. He had been present and had taken part in the discussion on this matter recently, and he was not quite satisfied as to the most desirable position at which to aspirate the pericardium.

Mr Cathcart asked if the sinuous line which the top of the fluid took could be explained by capillarity? Had the thickness of the column of fluid between the chest-wall and the lung and the height to which it rose any connexion?

Mr Miller asked whether empyematous fluid sank lower than ordinary pleuritic effusion? That was his opinion, and hence the reason for tapping lower in a case of empyema.

Dr Symington, in reply to Dr Ritchie's objection, said the lungs in his specimen and illustrations were not in a state of collapse, but in the condition of expiration in which the chest always was after death. So long as the pleural cavity was not opened the lung did not collapse further. He quite agreed that some of his points were already known, but there had been neglect of them in all the ordinary text-books, and none of the recent graduates to whom he had spoken appeared to know anything about them. The point which had not been referred to before was the non-extension of the fluid into the supplementary pleural cavity. This was a matter well worth studying. He brought it forward mainly to direct attention to it, because physicians had apparently neglected it.

Meeting V.—February 3, 1886.

Professor GRAINGER STEWART, *President, in the Chair.*

I. EXHIBITION OF PATIENTS.

1. *Professor Annandale* showed—(1.) A WOMAN, æt. 22, illustrating the successful treatment of a cirsoid aneurism by a combination of electrolysis and ligature of the chief artery passing to the tumour. The aneurism involved the left upper eyelid, and passing from it over the left forehead and temple were several large, tortuous, dilated, and strongly pulsating arteries. One application of electrolysis and the ligature of the temporal artery completely cured the case. Prof. Annandale remarked that he had successfully cured several cases of cirsoid aneurism by electrolysis alone, but that this was the second case in which he had employed ligature of the artery in combination with it. In the other case the tumour was much more extensive, and he ligatured the common carotid, and also employed electrolysis with complete success. (2.) A BOY, æt. 10, whose left tibia had grown three-quarters of an inch longer than the opposite one in consequence of stimulation of the lower epiphysis, owing to inflammation and necrosis of the shaft of the bone. As a result of this lengthening of the tibia, the foot had been gradually displaced outwards, so as to form a kind of talipes valgus. In order to remedy this deformity it was necessary to lengthen the fibula, and he did this by dividing the fibula at the junction of its lower and middle thirds. In addition, division of the peroneal tendons was required before the foot could be brought into position. The result had been most satisfactory, and the deformity was now quite relieved.

2. *Dr Cotterill* showed A YOUNG GIRL, aged 14, from whose trachea he had some five months previously removed a fibroma. The tumour, which was about the size of a small nut, grew from the posterior wall of the trachea at a distance of an inch and a half from the lower margin of the thyroid cartilages. The tumour was an example of an exceedingly rare condition, very few of such tracheal tumours having been diagnosed during life. Dr Mackenzie Johnston had discovered the growth, and had sent the patient to Dr Cotterill for treatment. As a paper was shortly to be read on the subject, Dr Cotterill merely pointed out the highly satisfactory result that had followed the removal of the growth, as the patient had entirely lost the aphonia and dyspnœa from which she suffered before the operation, and she had also improved greatly in general health.

II. EXHIBITION OF PHOTOGRAPH.

Dr MacGillivray showed for Dr Nasmyth of Cowdenbeath the

PHOTOGRAPH OF A CHILD, æt. 3, upon whom a double amputation of the thigh and leg had been successfully performed for injuries received, by the child having been run over by a railway train.

III. Exhibition of Pathological Specimens.

1. *Dr P. H. Maclaren* showed an ILEO-CÆCAL INTUSSUSCEPTION taken from a strong male infant nine months old, who died forty-eight hours after the first symptom of obstruction presented itself. Death was not a direct result of the disease, but quickly followed, from failure of the heart's action, an attempt to reduce the displaced bowel by the pressure of a column of water, for which purpose the child's hips were elevated and the trunk lowered. Besides the usual symptoms an oval tumour was detected in the left ileo-lumbar region, movable towards the middle line, and painful when handled. The abdomen was neither distended from meteorism nor collapsed, but distinct flattening was noticed in the right iliac region. The preparation illustrated the very formidable changes sometimes attending displacement of the bowel in very young children, the rapidity with which they were accomplished, and the utter hopelessness in the circumstances of any remedy, medicinal or operative. The intussusceptum was composed of the ascending and transverse colon with the greater portion of the ileum and their mesenteric connexions, all of which were greatly swollen and congested. The mass reached to within two inches of the anus, and was tightly screwed into a spiral shape, and terminated in a bulbous extremity in which the ileo-cæcal opening could be observed. In the concavities of the spiral the mucous membrane was closely pressed into firm transverse rings, and on the convexities the surface was smooth, dark red, and sprinkled with small coagula. The opening in the intussusception was reduced to a narrow vertical slit, but neither there nor in the bowel above, nor in the tumour, was there any sign of adhesive inflammation, corroborating the statement of Treves (*Intestinal Obstruction*, chap. viii.), that that process is never met with before the third day. The irreducibility of the mass was thus solely due to the constriction of the neck, the enormous congestive and œdematous swelling of the displaced bowel, as well as its rigid spiral form, occasioned by the dragging of the mesentery, which is so perilously loose in young children. The examination of such a specimen should tend to make the prognosis guarded, even when laparotomy is performed at an early stage of the disease.

2. *Dr Cotterill* showed a PAPILLOMA OF THE LARYNX of considerable size. This case had also been sent him by Dr Mackenzie Johnston for treatment. The tumour was pedunculated and grew from the right vocal cord. For three years the patient, a woman of about 60, had suffered from huskiness and attacks of dyspnœa;

and these symptoms had progressively increased in severity till the date of the operation. Intra-laryngeal treatment having been found impracticable, Dr Cotterill had removed the papilloma by slitting through the cricoid cartilage and crico-thyroid membrane, pulling down the growth from above, and twisting it off. The patient had made a perfect recovery, and at present her phonation was almost normal, while her attacks of dyspnœa had entirely disappeared.

3. *Dr Littlejohn* showed—(1.) A PIECE OF SKIN from inside of leg of a man, æt. 65, who had a varicose ulcer of old standing the size of a florin. He was a wood turner by trade, and as he was working at the lathe hæmorrhage occurred from the ulcer, and in the absence of assistance death ensued. Two hours had elapsed since he had been last seen. The specimen showed that one of the dilated veins opened on to the surface of the ulcer. (2.) A RIGHT FOREARM AND HAND in which an ordinary tableknife was firmly clenched. Deceased evidently committed suicide when insane, as marked evidence of chronic cerebral disease was found on dissection. The death had been slow, resulting from syncope from gradual loss of blood, and the entrance of blood in limited quantity into the air-passages. It was pointed out that where sudden syncope occurred from a large and rapid hæmorrhage the weapon dropped from the hand; but when, as in the present case, no large vessels were wounded, death took place slowly, and the weapon was found firmly grasped. (3.) A LOOKING GLASS bespattered with drops of blood, presenting all the characters of having escaped from a small artery. Deceased had inflicted the fatal wound standing in front of this glass.

IV. Exhibition of Inventions.

1. *Dr Foulis* showed an INSTRUMENT which could be used either as a stomach pump or as a means of sucking up fragments of a crushed stone from the bladder after lithotomy. It consists of an ordinary aspirator, the limbs of which are large and at right angles to each other. To the horizontal limb is attached a short vertical tube with a stop-cock. By means of a funnel, which can be easily attached to this tube, the stomach can be flushed with liquid, or an antidote to a poison may be caused to flow into the stomach, or the bladder may be constantly filled with an antiseptic lotion, all of which fluids can be immediately aspirated or withdrawn by a single pull on the syringe attached to the aspirator.

2. *Dr Allen Thomson Sloan* showed a NEW DIABETIC LOAF made from "Crude Gluten," manufactured by the "Health Food Co.," New York. He said that he would like to bring before the notice

of the Society what he might call a new "diabetic loaf." For the past few months he had had occasion to diet a friend of his suffering from diabetes, and for the first time, he thought, thoroughly realized the great difficulty of supplying a truly satisfactory substitute for bread. He first tried the various gluten preparations made by Sawers & Mackie of this city, and afterwards those manufactured by Messrs Van Abbott of London. These not only proved unpalatable, but produced an utter distaste for all other kinds of food. His attention was then directed to the "Crude Gluten Flour," prepared by the "Health Food Co.," New York, and from this the loaf he now exhibited was made. Though not absolutely free from starch, it contained less starch than any other bread allowable in diabetes. It was highly palatable, and, at the same time, very nourishing. Professor Austin Flint had used it in many cases with the most satisfactory results, and the experience of the "Health Food Co." extended over many thousand cases, to only a very few of which it had to be denied. He had used it regularly for the last four months in the case of a patient, aged 60, where the sugar, on two occasions for a week or so, had entirely disappeared, and where a careful quantitative analysis from almost daily observations had at no time showed any increase. Even more palatable than the bread were the scones made from this flour. These were best made with sweet milk and ordinary baking powder, and fired in a very hot oven. They were much better than those made from pure gluten flour, which had a bitter taste, and soon became very tough. His object in showing these preparations to the Society was to induce those Members who had diabetic patients, either in private or in the wards of the Hospital, to give them a fair trial, when he was certain, that far from proving injurious, they would be found to be as beneficial as they were sure to be welcome to the self-denying sufferers. The bread and flour were obtainable from Mr James Clark, 30 Greenside Street, Edinburgh.

V. Original Communications.

1. *Professor Annandale* read a paper on COMPRESSION OF THE INNOMINATE ARTERY, WITH NOTES OF A CASE. He considered (*First*), the temporary compression of the innominate artery in order to stay hæmorrhage from the right subclavian and first part of the right carotid during operation, or in connexion with injuries involving these vessels. He described a simple and efficient method of compressing the innominate artery by making a central cervical incision, such as is employed in low tracheotomy, and then gently inserting the finger or the blade of a compressor behind the artery, and compressing it against the sternum or sterno-clavicular joint. He referred to experiments which he

had made twenty years ago in connexion with some of Mr Syme's operations upon axillary aneurism, and he showed an instrument which he had had constructed at that time for compressing the artery. (*Second*), The question of compressing the innominate artery more permanently for the relief of aneurism of the right subclavian or right carotid arteries. He related the notes of a case in which he had endeavoured to cure a subclavian aneurism by compression in this way, but owing to the continuous pressure of a drainage-tube upon the artery (innominate), ulceration took place, and fatal hæmorrhage resulted before the treatment had been properly carried out. He specially directed attention to this unexpected risk from the pressure of a drainage-tube lying in a wound communicating with a large artery, and although this case had proved fatal, he was still in hopes that some modification of the treatment suggested might be an improvement in relieving aneurism upon the right side of the neck,—more particularly as ligature of the innominate artery had been proved to be so unsatisfactory a proceeding.

The President remarked upon the practical interest and value of such communications as Professor Annandale's.

Mr Bell endeavoured to account for the rapid production of fatal ulceration by the drainage-tube, on the theory that great arterial expansion of vessels of neck and aneurism would follow the exposure of them by the operation from the removal of the support naturally given by muscles and fasciæ, and related some illustrative examples.

Dr MacGillivray mentioned a case confirming the observations made by Mr Annandale, in which the pressure of a drainage-tube had led to secondary hæmorrhage from the popliteal artery, necessitating amputation, in a case of excision of the knee-joint.

Dr M'Bride hoped that the President and Members of the Society would excuse him for rising to discuss a matter of which he knew so little. Still he could not refrain from asking, entirely for his own information, whether it was not an old and respected axiom in pathology that constant pressure caused atrophy, while intermittent pressure tended to produce hypertrophy. He thought that this was the accepted explanation as to the occurrence of corns and other callosities on the skin. If this were so, was it not probable that the continuous pressure of a drainage-tube upon an artery would tend to produce perforation of its walls?

Dr P. H. Maclaren failed to detect any novelty of principle or advantage in the process of treating aneurism which Mr Annandale had just described. The danger arising from the pressure of a drainage-tube on the vitality of the coats of an artery has been long recognised even in situations where the counter pressure could never be so great as in the case under discussion. In amputations Prof. Spence carefully adjusted the drainage-tube so as not to touch the ligatured vessel. Pressure always is the invariable prelude to

ulceration, the rapidity of its occurrence and its extent being proportional to the amount.

Mr Cathcart pointed out that special experience with particular compressing agents, drainage-tubes or otherwise, seemed unnecessary when the general law of absorption from constant pressure was so well understood. He instanced the effect of a soft mucous polypus in the nose producing the so-called expansion of the nasal bones,—a process which in all probability was really an absorption of the original bone on the nasal aspect, with a corresponding periostitic new growth on the opposite or facial side.

Dr James remarked that although in the case of a normal artery exposure by the opening up of the surrounding parts would probably not render its walls more likely to gave way, yet if it were dilated, or if there was on it an aneurism, so that the opening up of the surrounding tissues allowed it to become more distended, and consequently increased the area of its internal surface, there would, according to the hydrostatic law, then be a greater risk of its rupture.

Dr Foulis said that as aneurisms of the larger bloodvessels were so constantly associated with an atheromatous condition of those vessels, he could not help thinking that at the spot where the burst took place there must have been a small spiculum of calcareous matter, or an atheromatous condition of the inner and middle coats of the bloodvessel. The indiarubber drainage-tube lying against the bloodvessel at this spot would act as a foreign body and cause an alteration in the structure of the external coat. As the result of the irritation, the fibrous elements would be converted into the looser cellular elements, and the bloodvessel would necessarily be reopened at that point. In addition, the greater intravascular pressure, after the operation of ligature, would subject this spot to a greater strain than the weakened external coat could bear, so that at last a sudden movement on the part of the patient would cause it to burst. He had difficulty in believing that a healthy large bloodvessel would give way under similar circumstances.

Dr Littlejohn regretted that the specimen connected with this case had not been exhibited, as many of the points alluded to by the speakers, and which had given rise to discussion, would at once have been cleared up; although the interesting debate, to which they had all listened with pleasure, would, in all probability, not have taken place, and thus the Society would have been the loser.

Dr Cotterill remarked that the proposition made by Mr Joseph Bell (to the effect that the hæmorrhage was induced by the altered blood pressure consequent on the removal of the support afforded by the fasciæ, etc., which had been cut through in the operation of exposing the innominate artery), was one which, if correct, should to a certain extent modify our action in exposing any large vessel

for the purpose of ligature or for other reasons. As far as he (Dr Cotterill) knew it was not a risk which was usually appreciated as such by surgeons. He asked whether it was not possible that the removal of the slight support afforded to the innominate by such fasciæ and cellular tissue was not compensated for by the more direct atmospheric pressure exerted on the vessel after section of the skin and other tissues overlying the vessel.

2. ILLUSTRATIONS OF UNCOMMON MORBID CONDITIONS OF THE EAR, NOSE, AND LARYNX.

By P. M'Bride, M.D., F.R.C.P. Ed., F.R.S.E., Surgeon to the Ear and Throat Department of the Edinburgh Royal Infirmary, and to the Edinburgh Ear and Throat Dispensary; Lecturer on Diseases of the Ear and Throat, Surgeons' Hall.

In this paper I propose to bring under the notice of Members of this Society some cases which seem to me of more than ordinary clinical interest—illustrating as they do morbid conditions and symptoms which are less commonly met with, or which are liable to erroneous interpretation.

(1.) *The Prognosis of Chronic Non-suppurative Middle Ear Affections.*

It is foreign to my purpose to attempt here an exhaustive discussion of this theme, to which, indeed, I have elsewhere referred at length.[1] The fact I now wish to emphasize by illustrations is that the surgeon should not be too ready to regard as hopeless cases in which the tuning-fork is heard by bone conduction worse in the deaf or deafer ear, and in which tinnitus is a more or less constantly present symptom. This is demonstrated by the results in the two following cases, the histories of which are necessarily somewhat briefly recorded, owing to the fact that they occurred in private practice:—

Mr ——, æt. 50, consulted me first on the 3rd October 1885. He had then suffered from singing in the ears for about 18 months, and slight deafness for a year.

Unfortunately, at this patient's first visit, my own watch was undergoing repairs, but that which I was wearing was heard on the right side at 12, and on the left side at 33 inches. This watch had a very loud tick, and could be easily heard at a distance of 15 feet by a healthy ear. The vibrating tuning-fork, when applied to the middle line of the forehead, was heard better in the left ear. Moreover, while it was perceived longer opposite the meatus than from the mastoid on the right side (*i.e.*, the ear which was more deaf), it was perceived better from the mastoid

[1] *Transactions of the International Congress*, London, 1881.

than opposite the meatus by the left or better ear. In other words, bone conduction was more interfered with on the side corresponding to the ear which was most impaired.

Both drum membranes were slightly thickened, but otherwise normal; air, however, entered the left tympanum more readily than the right by Valsalva's experiment. The patient had had attacks of giddiness, one rather severe, about a year ago. There was a history of naso-pharyngeal catarrh, and posterior rhinoscopy revealed the presence of slight congestion in the posterior nares. Inflation by Politzer's method improved the hearing on the left side, but not on the right. A guarded prognosis was given; the application of iodine, and the inflation of chloride of ammonium vapour by Valsalva's method recommended.

On the 8th of October the patient returned, and stated that he had suffered much less from tinnitus, which had, indeed, been quite relieved until the previous day, when it returned slightly. The tuning-fork was not heard better by bone conduction in the right ear, *i.e.*, the side on which it had previously been less distinctly perceived. The hearing was still far from perfect, but on this occasion Politzer's inflation improved the hearing of both ears. The patient was advised to continue the same treatment for a fortnight, and if not quite well to return. I did not after this see him again until the 24th of December, when I learned that he had considered himself perfectly cured, but had just been attacked again by the tinnitus. This relapse was again accompanied by *impaired bone conduction* on the right side, and, of course, this time, guided by previous experience, I ventured upon a favourable prognosis.

The impairment of hearing in this gentleman, which was present even after all tinnitus had disappeared, and was not sufficient in amount to interfere with his business or social intercourse, although noticeable when tested with the watch, was undoubtedly due to thickening within the tympanum. Every now and then, associated with obstruction, more particularly of the right Eustachian tube, tinnitus, impaired bone conduction, and sometimes vertigo set in. Whether this temporary impairment of function on the part of the auditory nerve, with occasional irritability of the semicircular canals, be due to physical changes in the middle ear, or to secondary hyperæmia of the labyrinth, cannot be positively decided.

The next case which I shall bring under your notice is in many respects similar.

Miss ——, a lady of plethoric habit, consulted me on the 25th Sept. 1885, on account of a noise in the left ear which had lasted for a week, and a feeling of giddiness. The throat had been rough for some weeks, and, unfortunately, I have no detailed notes on the results of rhinoscopic examination; but, so far as I remember, there was naso-pharyngeal catarrh, slight in amount. Hearing was represented by 9 inches on the left side, and 20 on the right—the

normal distance for my watch being 30 inches. The tuning-fork from the forehead was heard, so far as the patient could judge, only in the right ear.

Objective examination showed the left membrana tympani to be much indrawn, while the right was somewhat thickened but unchanged in position. Passing the Eustachian catheter, and forcing air through it, relieved the tinnitus for a few seconds only.

On the next day the tinnitus was still marked and troublesome, while the Eustachian catheter raised the hearing power to 17 inches on the left side. On the 28th I again saw Miss ——, and made the following notes:—H.D. $\frac{10}{30}$. Tinnitus remained away for half-an-hour after last visit, and has been less until this morning. Valsalva's inflation opens the left Eustachian tube, and raises the hearing to $\frac{14}{30}$, which the catheter further improves to $\frac{17}{30}$. Tinnitus is of two kinds, viz., resembling (1), trickling of water; (2), whistling; the latter can be relieved by patting the temporal region.

The application of a mixture of capsicum and ammonia to the temporal and mastoid regions, the chloride of ammonium inhaler by Valsalva's method, and the internal use of Kissingen and Harrogate waters, were advised. The result of this treatment was so satisfactory that on the 4th of October the hearing power was equal in both ears, and the patient completely relieved of her discomfort. Moreover, the vibrating tuning-fork applied to the forehead was now perceived equally on both sides.

The remarks which I have made on the previous case apply, in most respects, to this one also. Both cases are interesting alike from the specialist's and the physician's point of view, but it is only to the latter that I shall here refer. Both patients presented all the symptoms of Menière's disease, and in both I at first believed that I had to do with middle ear catarrh, associated with organic lesion of the internal ear; yet the alarming symptoms yielded speedily to treatment. *I would, therefore, draw the conclusion that in every case of suspected Menière's disease it is the duty of the practitioner to make a careful objective examination of the ears; and not only that, but also to try the effects of rational remedies applied to the middle ear whenever it is possible that it may be in a catarrhal condition, and when deafness is not so absolute as to prove disorganization of the peripheral endings of the auditory nerve.* In this connexion it must not be forgotten that chronic non-suppurative otitis media may run its course with but very slight objective changes. I shall now refer to a case which, while illustrating the negative value of the tuning-fork test, also demonstrates the fact that even when ear disease is present, together with tinnitus, it should not be always assumed that the two conditions stand to each other in the relation of cause and effect.

It has long been my belief that in many instances tinnitus aurium is immediately due to changed tension in the blood-vessels of the labyrinth. It is obvious that such a change of tension may be due either to increased or diminished pressure upon the labyrinthine fluid (such as occurs in ear disease), or to changes in the quality of the blood itself (such as may be due to anæmia, gout, etc.) Again, increased or diminished force of the circulation or vaso motor changes may lead to the same result. In fact, I believe that while the labyrinthine circulation is under normal conditions it is not perceived as sound, but that this occurs with every deviation from the normal. An exact parallel is found in the heart-beat which is not felt in health, but is perceived whenever it is either abnormally strong or weak. How important are attention to the general health, and more especially to the condition of the blood, in treating tinnitus the following case shows:—

Miss ——, æt. 42, consulted me on the 11th October 1885, and had then suffered from tinnitus in the left ear for eighteen months. The sound heard by the patient seemed to be hammering and synchronous with the pulse. At first it came and went, but at the time of her visit to me had become constant. The patient had consulted a London aurist of eminence, who gave a very bad prognosis, which, in conjunction with the tinnitus, gave rise to great depression. Hearing distance, L. $\frac{3}{60}$ R. normal, while the tuning-fork in this case also was heard by bone conduction better in the right or good ear. The tympanic membranes were normal, and moved freely with Valsalva's inflation, which also improved the hearing power of the left ear to 20 inches. The use of chloride of ammonium inhalations and the application of iodine over the mastoid were advised, with the result that Miss N. returned on the 19th of October with perfect hearing in both ears. The tinnitus, however, persisted, so that some further cause than the slight Eustachan catarrh, which had disappeared, must be sought. Although the patient had a remarkably ruddy complexion, examination of the mucous membranes and auscultation elicited evidence of anæmia. Blaud's pills and hydrobromic acid were prescribed, and their use was followed by great improvement, so that on the 2nd of November the tinnitus had almost quite disappeared, and I have since heard that she is now quite well, and once more able to enjoy life.

This paper would exceed its proper limits were I to refer further to the subject of tinnitus generally, and I can only add that, next to local affections of the ear, I believe anæmia and lithæmia are its most common causes. It might be urged that the cure of the tinnitus in this case was due to the hydrobromic acid prescribed, but a somewhat extended trial of this drug has led me to be very sceptical as to its efficacy, and I have no hesitation in ascribing the beneficial result to the iron pills, with which I have before succeeded in producing similar results in properly selected cases.

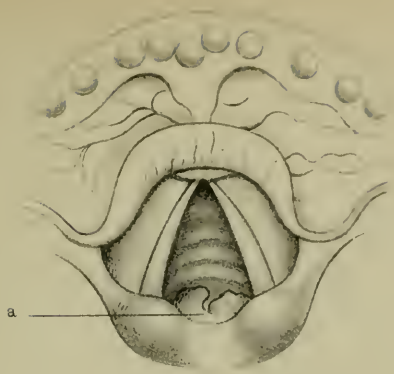
(2.) *Circumscribed Papilloma-like Growth in the Inter-arytenoid Fold in Phthisis.*

It is now generally accepted by German writers that, to use the words of Gottstein,[1] "a circumscribed prominent thickening in this situation (*i.e.*, the inter-arytenoid fold) must be looked upon as a sure sign of tuberculosis, even when all other evidences of phthisis in the lungs and larynx are absent." Stoerk[2] fully corroborates this view when he writes:—"This condition of the inter-arytenoid fold is only of diagnostic value when all signs of tubercle in the lungs are absent, and even the most skilled physician can find no grounds for suspecting its existence. In such cases I consider the occurrence of such granulation tumours on the posterior wall (of the larynx) as an unfailing sign of developing tuberculosis." Considering these views so definitely expressed, it is rather astonishing how little mention is made of inter-arytenoid tumour as a sign pathognomonic of tuberculosis in English text-books on laryngology.

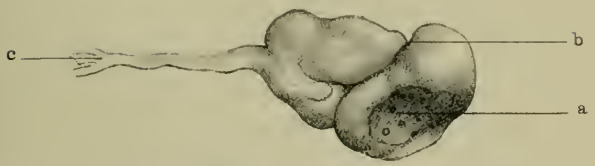
The following case illustrates this condition:—

A girl, æt. 20, was sent to see me by Dr Morison, of Hartlepool, and examined at the end of September 1885. The history was to the effect that she had lost her voice for twelve months. Laryngoscopic examination showed slight general congestion, and the presence of a flat tumour springing from the inter-arytenoid fold, which, by its projection into the larynx between the vocal processes, prevented their approximation. (Plate, fig. 1.) This tumour was divided into two unequal parts by a sulcus on one side of the middle line. The laryngoscopic appearances led me to further question the patient, with the result of obtaining additional evidence of a tubercular taint. Her sister died of a chest affection; she herself had suffered from cough for eighteen months, had an attack of hæmoptysis at the end of March 1885, and thought she was getting thinner. It may, however, be remarked that at the time of my examination she was well nourished, and even plump. Examination of the chest at this time gave the following results:—(1.) Dulness over both apices. (2.) Expansion fairly good. (3.) Bronchial breathing over right apex. (4.) Coarse crepitations over left apex in front, and friction behind in supra-scapular region. Unfortunately I have not notes of the temperature, and an examination of expectoration for bacilli, kindly undertaken for me by Dr Batten, was negative. Now comes the interesting point in the case. While the cough, aphonia, and even hæmoptysis all occurred before the 3rd of July, a careful examination of the chest was made on that date by Dr Morison, without revealing the presence of any physical signs pointing to phthisis. A laryngoscopic examination, however, on the 11th of July, showed the tumour to

[1] *Diseases of the Larynx*, by Gottstein. Translated and added to by P. M'Bride, p. 219. [2] *Klinik der Krankheiten des Kehlkopfes*, pp. 283-4.

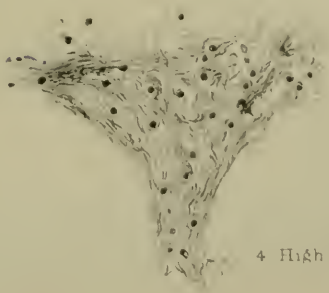


1 (a) Tumour in inter-arytenoid region



2. (a) Cut surface through trabecular structure.
(b) Sulcus almost dividing tumour into two parts
(c) Pedicle

3 Low power



4 High power

be present.[1] In this case, then, we may assume—as the aphonia had lasted for a year, and the tumour was its only cause—that the growth was present nearly a year prior to the development of the pulmonary signs.

True neoplasms are very rarely, if ever, found growing from the inter-arytenoid fold, so that when a circumscribed swelling occurs in this region we may almost certainly say that it is due to tubercular infection. I say almost advisedly, because it does occasionally happen that a syphilitic ulcer occupies this situation; the upper margins may then grow into papillary excrescences, and by concealing the ulcerated surface lead to a suspicion of latent tubercle. According to Stoerk,[2] phthisical tumours in this region are commonly composed of connective tissue similar to that met with in the walls of phthisical pulmonary cavities.

In a letter, dated 1st Jan. 1886, Dr Morison writes as follows: —"The girl at present is fairly well. The laryngeal growth is certainly less. She continues strong and stout, and her chest about the same, though since coming here she has lost flesh."

(3.) *Erection of the Inferior Turbinated Bodies.*

It is now well known that the mucous membrane of the inferior turbinated bones contains cavernous erectile tissue, more particularly at its anterior and posterior parts. Erection may be due to irritation in some adjacent part of the nose or at a distance. Recently Hack has written at length to prove that various neuroses may be due to increased volume of the inferior turbinated bodies, and he has further succeeded in curing such affections as asthma, megrim, neuralgia, etc., by galvano-caustic destruction of the mucosa in this situation. These views have been more or less corroborated by various writers, and have perhaps led to a somewhat wholesale destruction of nasal mucous membrane with heated platinum points. Still there can be no doubt that many good results have been obtained. Reflex neuroses, which may owe their origin to nasal disease, are thus classified by Schech.[3]

1. Neuroses affecting the nose itself, ... { Nervous coryza associated with paroxysms of sneezing.
2. Neuroses affecting adjacent parts, ... {
   (1.) Ptyalism (rare).
   (2.) Neuralgia, especially supra-orbital, also megrim and occipital headache.
   (3.) Vaso-motor disturbance causing swelling of the face and conjunctivæ.

[1] For these particulars I am much indebted to Dr Morison. [2] *Op. cit.*
[3] *Die Krankheiten der Mundhöhle, des Rachens und der Nase*, p. 193.

3. Neuroses affecting more remote parts, . . .
   - (1.) Possibly vertigo, and epilepsy.
   - (2.) Cough.
   - (3.) Vaso-dilator impressions to the mucous membrane of the bronchi, observed by Sommerbrodt.
   - (4.) Asthma.

In relation to the treatment of the nasal swelling by means of the galvanic cautery I believe, from my own experience, that Semon [1] takes up the proper position when he advises that even if no other cause can be found for the neurosis after careful examination, yet no result should ever be promised to the patient from operative interference with the nasal mucous membrane.

The case I am about to refer to was that of a boy 17 years of age, who consulted me on account of his nose being "always stuffed," and headaches—which, on close questioning, seemed to be more of the nature of vertigo than cephalalgia, and which I have little doubt were due to the auditory apparatus, as there was catarrh of both tympanic cavities; I may therefore here state that this case is not brought forward as an example of reflex neurosis. The patient had, however, immense erectile swelling of the inferior turbinated bodies. On the 30th of October anterior rhinoscopy showed this condition most marked on the right side, where the tumour touched the septum. After the application of a 10 per cent. solution of cocaine this diminished to about a third of its original size, and remained small for at least four days. Later, the same treatment was used on the other side, but the effect only lasted for about eight hours. That cocaine has the effect of diminishing erectile swelling of the turbinated bodies has been recognised since the fact was first pointed out by Bosworth; but that its effects in this respect may last for days is not so well known,[2] and I have thought it worth while to bring forward this example as an illustration.

The further progress of the case, too, was of some interest, for it was found that the probable source of irritation was to be sought in adenoid growths—small in size and amount—occupying the vault of the pharynx. These were crushed, and still further relief was obtained—the other treatment consisting in spraying the nostrils with an alkaline lotion. In view of this action of cocaine, it seems to me that its regular employment should precede operative interference, both with the hope of effecting permanent amelioration of the condition; or if this be on further trial found

[1] German edition of Morell Mackenzie's work, edited by Semon. Editorial additions, p. 501.

[2] Dr Cresswell Baker informs me that he has known the effect to continue for ten days. (Communicated by letter.)

always to be but temporary, with the view of ascertaining whether keeping under the swelling of the erectile tissue on the inferior turbinated bodies has a favourable effect on a coincident neurosis.

(4.) *Fibro-Mucous Polypus of the Naso-Pharynx.*

According to Mackenzie,[1] Panas and other French observers have described tumours growing from the vault of the pharynx, which present a transition of structure from mucous polypi to fibrous tumours. Unfortunately the works of the authorities quoted are not accessible to me in the original, so that I have been unable to obtain particulars as to the exact microscopic structure of these tumours, and I must therefore content myself with giving a brief history of a case upon which I recently operated, together with some pathological details.

Mrs ——, a middle-aged lady, suffered for some years from symptoms of nasal obstruction. The history of subjective sensations is somewhat incomplete; but it was particularly noted that the patient complained of nasal obstruction which varied, as she thought, according to the weather, but that there was never any sensation of a movable body in the naso-pharynx. The discomfort seems to have been sometimes very great, obliging her to get out of bed and walk about; at the same time, there was never any attack of an asthmatic nature.

On inspecting the nostrils anteriorly with strong reflected light, a movable mass was seen far back on the right side. Inspection of the pharynx showed nothing abnormal, but posterior rhinoscopy at once revealed the presence of a tumour lying upon the soft palate and filling up the posterior nares. The first view showed the neoplasm as a rounded smooth mass; but after attempts had been made to seize it with forceps, it appeared as if there were two polypi close together.

Digital examination, however, proved that there was only one very mobile tumour. Attempts at removal without anæsthesia were futile; so the patient was put under chloroform, and efforts made to extract the tumour by means of various instruments. The neoplasm was, however, so extremely mobile, that this was found to be impossible. Thus if curved forceps were introduced and the growth guided with the finger, so far as possible, between the blades, their approximation caused it to slide forwards. Again, if a wire snare was passed through the right nostril, it was found impossible to get it over the tumour, because the latter slipped into the posterior part of the left nostril. Dressing forceps, introduced through the nostril, were not used, because it was evident that the pedicle was attached very high up, and could

[1] *Diseases of the Throat and Nose*, vol. ii. p. 532.

not in this way be reached; and to open the forceps sufficiently to admit the body of the growth without causing serious damage to the osseous structures would have been, I believe, impracticable. The question then arose as to splitting the palate; but being unwilling to proceed to this extremity, I resolved to try what Nature's instrument, in the shape of an index finger, would do, more especially as the mobility of the tumour was such as to lead me to believe that it must be attached by a very long and slender pedicle. I therefore again passed in my finger, and by wedging the tumour against the left Eustachian prominence, succeeded in getting it away.

When first removed, the tumour was between the size of a pigeon's and a hen's egg, but it has now diminished considerably. The pedicle was about 1½ inch in length, and the growth itself is divided into two parts by a deep sulcus, almost as if there had originally been two tumours, although, of course, the single pedicle negatives such a possibility (see Plate, fig. 2). The shape, I take it, was produced by the growth being constantly forced against the posterior margin of the septum narium by the respiratory current. My friend Dr Alexander Bruce very kindly undertook to prepare a small portion for microscopic examination, without injuring the specimen as a preparation. With this object in view a small piece was cut off. From the cut surface a viscid matter exuded, which formed a flocculent deposit in the vessel, which contained the growth and a solution of chloral. The cut surface afterwards showed a trabecular structure, as shown in Fig. 2. This structure was, of course, still more manifest under the microscope. With the low power a delicate fibrous tissue was seen to enclose spaces of different sizes, while nuclei were present in comparatively small numbers (Fig. 3). When viewed with a high power the delicate texture of the fibrous tissue was still more evident, with here and there a complete connective tissue corpuscle (Fig. 4). Both Dr Bruce and myself were struck by the entire absence of epithelium, both from the exterior of the tumour and the interior of the trabecular spaces. This was most probably due to the treatment of the tumour after removal, although to what stage of the process we were unable to determine. The structure of this tumour seems to correspond exactly with what is described by Zeigler[1] in the following words:—"In loose-textured fibromata a clear juice is contained between the fibrous bundles, which are crossed and plaited and interwoven in all directions." That it could fairly be described as a transition form between mucous polypus and fibroma, I do not think. I have at various times examined many mucous growths from various parts, and have invariably found that microscopic examination showed numerous connective tissue cells, with a delicate undifferentiated stroma.

[1] *Path. Anatomy*, pt. i. p. 196.

In hard growths the cells gradually elongate into spindles, and in some exceptional cases the whole growth is found to consist of coarse fibrous bundles, showing no tendency to the formation trabeculæ, which to my mind is the typical transition. I would also here observe that true myxomatous tissue—*i.e.*, branched cells—is, so far as my experience goes, only met with in sections of mucous polypi occasionally, and then only in small patches.

Some days after the removal of the tumour, a rhinoscopic examination showed the naso-pharynx to be normal, with the exception of a small spot just behind and a little to the right of the upper end of the septum, which was covered with muco-purulent discharge and blood. This I assumed to be the point of attachment of the growth, and being in the least accessible part of the nasal cavity, it accounted for the difficulty experienced in operating.

The President, in thanking Dr M'Bride for his communication, expressed his satisfaction at seeing that the character of the work of Edinburgh specialists continued to be so high. He remarked that the paper gave evidence of general medical culture as well as of special knowledge; that he had heard of some specialists whose work was like the lights used in their rooms,—very bright on the individual spot, but surrounded by general darkness. Dr M'Bride represented that good school of specialists, who could throw as intense a light upon the special subject as any one, and yet had a good illumination all round.

Dr James said that among the large amount of material of great practical interest which this paper contained, what seemed to him to be of particular interest was the association of a peculiar laryngeal lesion with the development of phthisis. That in a case where this apparently slight laryngeal mischief existed, the onset of pulmonary tubercle at no distant date might certainly be predicted, was the opinion of laryngologists, but he should like to hear Dr M'Bride's opinion of the connexion. Supposing that the laryngeal lesion were tubercular, the development of pulmonary symptoms might reasonably be explained by resorption; but in the absence of such a tubercular focus, could not the more or less incessant coughing tend to bring about apex mischief?

Dr Mackenzie Johnston thought the paper one of great interest both to the specialist and to the physician. The importance of recognising the symptoms of tinnitus and auditory vertigo was evident, for the physician frequently met with such cases. He had himself recently seen a lady who had been under treatment for a long time in England for gastric derangements, where the cause of the distressing symptoms, he found, was due to chronic catarrh of the middle ear, which yielded to appropriate treatment. Referring to the laryngeal case, he said, that from the drawing he recognised it as a case that he had seen with Dr M'Bride. He

had had no difficulty in diagnosing the inter-arytenoid growth, but not then having heard of Stoerk's observation, he had not known its significance. The case was a corroboration of a most important observation, and was a further proof of the assistance that medical diagnosis can receive from the use of the laryngoscope. As to the cause of this growth, he should like to suggest that (as touched upon by Dr James) the cause might be due to the irritation and constant movement of the inter-arytenoid fold in coughing. An argument in favour of that would appear to be the frequency of tumours in the larynx, while in the smooth, inactive canal of the trachea they were extremely rare.

Dr M'Bride begged to thank the Society for giving him their kind attention. Owing to the late hour, he would endeavour to condense his reply as much as possible. Dr Duncanson had expressed a desire to hear his views of Dr Cooper's theory. So far as he remembered, this author believed that most of those cases which aurists look upon as due to chronic catarrh were really due to a vascular dyscrasia, — "basic aural dyscrasia," according to Dr Cooper. Dr M'Bride frankly admitted that he had been unable to follow the arguments which led to this view. If he remembered rightly, one of the chief arguments used in the paper was the frequent presence of a subclavian bruit in the class of cases referred to; but how easily could such a murmur be produced by a little additional pressure upon the stethoscope! In some cases anæmia existed—as he had shown in his paper this evening—associated with chronic middle ear catarrh, and might be of itself a factor in causing tinnitus. In such cases, of course, iron was extremely useful. Dr James had asked the question whether in such a case of inter-arytenoid tumour as the one described, the pulmonary mischief might not be caused by the act of coughing. Dr M'Bride hardly thought this likely. At the same time, it was but quite recently that the first autopsy of a case of primary laryngeal phthisis had been made. During life it was, of course, impossible to be certain as to the absence of deep-seated, small, caseated nodules. He did not think that the connexion between inter-arytenoid tumour and phthisis had yet materially advanced beyond the stage of clinical observation. It must also be remembered that in phthisis, and with rare exceptions, if any, in phthisis only did a true tumour appear in this situation. With regard to the nasal tumour, he would like again to call attention to the fact, that had the tumour been attached by a shorter pedicle to the lower part of the posterior nares, the operation would have presented little difficulty. It was the fact that the neoplasm was inserted in the most inaccessible part of the nasal cavity by a long pedicle that made its removal only possible by means of traction with the finger. Moreover, at one period of the operation, the growth had got impacted in the left nostril in such a manner that it could only be felt after it had been pushed back

again with a gum elastic catheter; this fact alone gave some idea of its mobility. Dr Johnston had referred to hydrobromic acid in tinnitus, as recommended by Dr Woakes, especially in the pulsating variety. Dr M'Bride thought his experience as to its negative value tallied with that of many other observers.

Meeting VI.—February 17, 1886.

Professor GRAINGER STEWART, *President, in the Chair.*

I. ELECTION OF ORDINARY MEMBERS.

Professor W. Greenfield, M.D., F.R.C.P. Ed., and Oswald Wood, M.B., F.R.C.S. Ed., were elected Ordinary Members of the Society.

II. DISCUSSION ON ABDOMINAL SECTION, INTRODUCED BY LAWSON TAIT, F.R.C.S. Ed., F.R.C.S. Eng., Birmingham.

The President, in opening the meeting, said that before proceeding to the business of the evening—a discussion on "Abdominal Section"—he felt that every member and visitor would deem it appropriate that notice should be taken of the absence from amongst them of one who would have been one of the leading speakers on that subject if he had been spared to take his place there. He was sure every member had watched with the greatest interest the career of Dr Angus Macdonald, and with the greatest anxiety had heard the conflicting intelligence received as to his condition from time to time during the past few weeks. His death was a great loss to the profession in Edinburgh, and, in particular, to that department in regard to which they were looking forward to an interesting debate that evening. Every one sympathized with his relatives in the sad circumstances in which they were placed, and he was sure that as a Society they would desire to express their sympathy with them. They would now proceed to the business of the evening, which was to be a debate on "Abdominal Section." They were fortunate in having among them one of the most successful operators in that department, and an old student of the Edinburgh Medical School, Mr Lawson Tait, and he had great pleasure in asking Mr Lawson Tait to open the discussion.

Mr Lawson Tait then said—The position which abdominal surgery has taken within the last fifteen years, and which it now occupies as an advance on its attitude at the beginning of that period, is wholly unexampled in the history of our art. I remember very well that my old master, Professor Miller, used to dismiss the whole thing in the very forcible words, "that abdominal

surgery was abominable surgery;" and despite the strenuous advocacy of Sir James Simpson and Dr John Hughes Bennett, no kind of professional acceptance for it was obtained. I remember very well that I left Edinburgh in 1866, just twenty years ago, with many intentions, some of which have gone to form pavement, but with one which I felt more profoundly convinced would be maintained than any other, and that was, that whatever might be my fate in the ranks of my profession, I never would incur the awful responsibility and the odium which I had seen to accrue from this kind of work. In fact, I felt perfectly certain that if there was one operation I never should do, it was abdominal section. What a contrast this is to the actual fact! During these twenty years I have performed this condemned operation nearly 1400 times, and with a constantly diminishing mortality, even when the operations have been of the gravest kind. Thanks to the foresight and caution of Sir Spencer Wells, those of us who work in this department of surgery have fallen into the most commendable habit of recording, in authenticated details, all our cases; and we publish them, at least those of us who do as ought to be done, in such a way and in perfect sequence of order that there can be no disputes—certainly there never has been the slightest dispute—as to the authenticity of the record. What disputes have arisen have been determined by difference in views about classification and other points which are not yet quite settled, but which are hardly pertinent to the broad issues which I wish to raise to-night. For my own part, I have followed the practice of publishing my results year by year, beginning on the 1st of January and ending on the 31st of December. Simply, therefore, as a foundation to the argument which I am about to lay before you, I want to draw your attention to two striking statements of fact.

First, That from the beginning of January 1884 to the end of December 1885, I have been responsible for the treatment of 139 cases of ovarian and parovarian cystoma; and I have accomplished the operations involved therein without a single death; and not only this, but there is not a single incomplete operation to charge myself with within that period where these two classes of disease were concerned. Let me also say that in these 139 cases the tumours varied in size from dermoid cysts of 6 or 7 ounces in weight up to huge multilocular cystomata weighing over 100 lbs.; that the complications involved in them were endless and varying in their severity; that adhesions were met with of every possible kind, and in connexion with every internal pelvic and abdominal organ; that the pedicles were of every shape and variety, from the long narrow connexion which is secured in a few seconds by the application of a ligature, to the sessile insertion where there was no pedicle at all, and where the whole mass had to be enucleated from its uppermost points down to its deepest pelvic relations; that in

some such cases, three in particular, neither cautery, nor ligature, nor any other hæmostatic was of the slightest use, and I had to secure the bleeding points by catch forceps, leaving these closed up in the abdomen for many hours and then reopening it and removing them. There was, in fact, no kind of difficulty which was not embraced within these 139 cases, and yet without exception they recovered.

The second statement of fact is—That I have now performed 113 exploratory incisions, and that amongst these there can be reckoned only three deaths; but even these should not be credited in the least degree to the performance of the exploratory incision. What was the real fact is, that the exploratory incisions having failed to enable me to relieve my patients, they died of the progress of the disease, but within such time as that they could not be fairly said to have recovered from the operation. With such remarkable results as are here displayed within the short space of my own experience from the time when I left this hall a recently admitted licentiate of this College, to the time that I now return to it honoured by a request to address this distinguished assemblage, hardly yet having approached middle life, I think I am justified in what I say, that no department of our art has shown such striking advances. It is perfectly true that almost within the same time ophthalmic surgery has jumped from a position of routine practice to that of almost an exact science; but it did not start, as my own department did, in the midst of hostility, not passive, but of the most active, and sometimes vindictive kind.

A most interesting inquiry is at once opened by these two statements of fact as to how we can explain the startling contrasts achieved within the short space of twenty years. It is possible now to give perfectly satisfactory answers upon most of the main points of the inquiry, in spite of much throwing of dust, which has been practised upon those who were anxious to arrive at the facts of the case. Historical investigation shows that the first ovariotomy by Houston of Carluke was successful, and he used a short incision, only four inches, and he tied the pedicle and dropped it back. M'Dowel was successful, and he followed Houston; so was and so did Nathan Smith. In England a wider departure from this practice was adopted: incisions from 8 to 18 inches were made, the long ligature and the clamp were used, and so from Clay down to Spencer Wells a mortality of 25 per cent. was maintained. Baker Brown brought the death-rate down to 12 per cent. by using the cautery and closing the abdomen. Keith rapidly improved on this. In my second series of fifty cases of ovariotomy, my mortality was 6 per cent. It fell to 4, then to 2, and you have heard that in my last series no mortality has occurred. My belief is that we have banished all deaths except those that must arise occasionally from tetanus, bronchitis due to the anæsthetic, and accidents which cannot be foreseen or avoided.

Sir Spencer Wells was very anxious to attribute the increasing success to the employment of the system known as Listerism, but that has been absolutely banished from my practice since 1881, and Sir Spencer Wells stands alone now in his argument.

There can be no doubt that to the intraperitoneal treatment of the pedicle and to the shortening of the incision a very large share of our success is due. But there are other factors too important to be overlooked, and I prefer to take them in the order of their importance, as it seems to me.

The factor of the subdivision of labour, or, as it is generally known, specialism, is, I believe, a leading feature in our success. There is a fashion to cry down specialism, particularly on the part of those who are injuriously affected by its progress, but this cry will do little to injure its prospects. It has been a royal road to success in every other walk of life, and the world is too far on in the path of social evolution for this weapon to be excluded from the fight with disease. The specialism of ophthalmic surgery has proved an infinite boon to humanity, and no one would like to see the distinguished President of our own College of Surgeons supplanted by one who practised midwifery and attended measles and scarlet fever. Equally, the specialism of gynæcology promises well, and it is, most curiously, already quite separated, south of the Tweed, from midwifery, with which it has been so long and inextricably mixed up. Most assuredly I believe it to be true, that any man desirous of being able to remove a hundred ovarian tumours with only two or three deaths, should separate himself from what is known as general practice, and devote himself specially to the work. That there are one or two brilliant exceptions is true, but it is only too certainly the rule that those who are mixed up with midwifery and with general surgery fail to get results which can justify their continuing to perform abdominal sections.

It is equally true—in fact, it is the mere appendix to what I have said—that men to whom it is likely that it will fall only once or twice a year to perform ovariotomy do it badly and unsuccessfully. It would ill become me to condemn such men, and I would not do it were it not that the condemnation comes from a far higher source than I can ever be.

James Syme was not only the greatest surgeon I have ever seen, but he was the greatest teacher of medical ethics I have ever listened to. I never can forget a lecture he gave us about a quarter of a century ago on methods of success in practice; and however imperfectly I may have carried his principles into practice, I know that what success I have had in life has been due to my efforts to follow them. "There are three ways you may try," said the great master, "there are three interests you have to consider, and it will depend upon the order in which you consider them how success will be measured out to you. The first interest is your

own, and it may seem to you the greatest, whilst it is really the least. The second interest is truly greater, for it is the interest of your professional brothers; but the last is the greatest of all, for it is the interest of your patient, and with that is eternally related the interest of the art you practise."

More wholesome words than these have rarely been heard; and just as I am satisfied that no one now rushes into performing operations for cataract who is not, or at least has not some prospect of becoming, an ophthalmic surgeon, so I think the laparotomy epidemic ought to be a good deal restricted, not in its application, but in the number of those who venture into it. In Syme's own words, the real interest of the whole business is the interest of the patients upon whom we practise, and unless we secure for them the best possible results we injure them, we injure ourselves, and, worst of all, we injure the art to which we have devoted our energies.

In the early days of our practice, I speak for myself of the years from 1867 to 1877, we were wont to credit much of our failure to causes outside the lines of our personal relations, and a great deal of nonsense was talked and believed. Keith altered much of this by boldly asserting that we ought to look into the details of our operations for causes of failure, and not blame things outside. In my own case, I believed that the air of the town had a prejudicial influence, and so we moved our hospital out into the country, and had complete isolation of each patient, with numerous and troublesome precautions for disinfecting the rooms after every operation. All these, or at least most of them, have been proved to be useless, for I have a large private hospital right in the middle of the town, and I have dropped all the precautions one after another with no ill effects. In fact, Dr Emmett of New York, who has been to inspect my proceedings, has gone so far as to say that "circumstances may favour me by living in a manufacturing district where the atmosphere is thoroughly charged with carbon, which in the form of soot penetrates everywhere." But in the same manufacturing district, in the Birmingham General Hospital, the ovariotomy mortality is 35 per cent., so that smoke is no safeguard. I use the old building which used to be the public hospital for my private patients, the only difference being that we used to have the out patients in the basement, and now there are none.

Following the mistaken views of Sir Spencer Wells, I used to have a great superstition about people bringing infection from outside, and I had an especial horror of zymotic diseases. I used to insist on everyone coming to my operations declaring that they had not been near any source of infection for seven days; now I never trouble to ask them where they have been. Two unwitting experiments settled this question for me. Some years ago a young girl came to me from Cornwall for an ovariotomy. Whilst removing the stitches on the seventh day I noticed that she was

desquamating, and I found on careful inquiry that there could be little doubt but that she had scarlet fever at the time of the operation so slight as to attract no notice. I need not say that we took every precaution against the disease spreading, and I determined to do no more operations for a fortnight. But I was too late; I had carried the disease into my private hospital, and in the two institutions eleven cases of abdominal section, and three nurses, caught the disease without any of them being one penny the worse, save one of the nurses, who had a very sharp attack of articular rheumatism as a sequel.

On another occasion, I had been touching a child convalescing from scarlet fever, and desquamating, when I was called upon to re-open an abdomen on account of violent and sudden hæmorrhage. In the hurry I did it without even washing my hands, but the patient suffered nothing in consequence, though I must have had scales with scarlet fever germs in abundance on my hands. I need not say that I would not deliberately allow access of any specific poison to one of my abdominal sections any more than I would allow it to any one else, but I am sure we have talked nonsense enough on this subject.

We also have talked very much against the performance of these operations in general hospitals without a clear recognition of the fact that conditions in these institutions may vary very much. We have blamed the institutions rather than the men who have operated in them. Keith's results in the Edinburgh Infirmary show that in skilled hands the propinquity of other cases is no bar to success. In a smaller way I have found the same thing. I have performed thirteen of the more serious operations of abdominal surgery in the general wards of general hospitals with uniform success.

I fancy, therefore, that we must begin to saddle upon the back of those who do these operations the major part of the blame for want of success.

The committee of my own hospital took this bold and unprecedented step in their last annual report to the subscribers. The mortality of the abdominal sections in our hospital last year rose to 9·8 per cent. as against 5·6 for the preceding year; and the committee promptly told my colleague Dr Savage and myself that they held us mainly responsible for want of success. We did not quite like the idea, but within limits there can be little doubt that the view is correct, and the responsibility of defending and defining the limits must lie with the operators. The apparent fact is, that we judge of results everywhere and in everything by success; and the feeling that we are to be judged by results, benefiting by those that are satisfactory and suffering from those that are bad, must form the best incentive for the exercise of that constant supervision over every detail which alone can secure success. If this is not so, why are those of us who are successful so ready to dis-

play our tables, and why do we hear so little from those whose lists would display very different accounts? There can be no doubt of the necessity for the introspection advocated by Dr Keith. The more it is carried out the better will be our work.

I am desirous at this time to discuss general principles rather than details, and therefore I come at once to the application of the successful issues already detailed to the extension of our particular department.

No sooner had Keith shown us the main lines of success than another great advance followed. The rule had been to temporize with ovarian tumours as long as possible, to tap them and tinker with them, to do anything rather than submit the woman to a risk of 25 per cent. But with 10 per cent. it was different. Bantock and I at once raised an outcry against tapping and delay, and we advocated in and out of season the practice that ovarian tumours should be removed as soon as they were recognised. Our views are now almost universally adopted, and in this way another reduction in the mortality of 6 or 8 per cent. was brought about. Old adherent tumours which have been tapped are now the exception, whilst fifteen years ago they were the rule. Not only has the primary mortality been thus reduced, but I believe the secondary mortality has also been enormously diminished. I believe that the number of cases dying of cancer some months after ovariotomy is now very much less than it used to be. I cannot support this belief by figures, but I can support by figures the fact that unfinished ovariotomies are practically banished from my practice; and this is a conclusion pregnant with suggestiveness about the co-existence or future occurrence of malignant disease.

A 5 per cent. mortality in ovariotomy banished our fears of the peritoneum, unshackled our hands, and set us thinking what else we could turn them to. Most of my senior brethren became alarmed, their natural and very praiseworthy conservatism brought forth remonstrance and even unkindly interference. Even the great master in the North complained of the "restless surgery of the present day, which would leave nothing alone." But progress was a matter of necessity. The first brilliant achievement, one which greatly excited my envy, was that of Graham of Liverpool, to whom was brought a patient upon whom Spencer Wells had pronounced the doom that nothing could be done. Graham, as he has himself graphically told me, discussed with the patient the alternatives of inevitable death and "a chance of recovery." They decided upon an operation, and Graham made an exploratory incision, went on, and successfully completed an operation so bad that anything after it seemed possible. Here was a new departure —the great master of abdominal surgery vanquished by a novice, and the great principle of exploratory incision established.

Many cases came under our notice in which it was by no means clear that the disease was ovarian tumour, yet the unwritten law

of Spencer Wells was that none others were to be interfered with. It is true that he did meddle with a few cases not ovarian, but that was by accident, such as an occasional removal of the spleen; but the advanced practice steadily gained ground, though not without much opposition and adverse criticism. The field was fairly opened, however, when I ventured on my first list of hysterectomies, with a mortality of 50 per cent. The region of the kidney was developed by the marvellous case of Campbell of Dundee, in 1873, who removed a huge cystic kidney by mistake; and I advocated the removal of diseased kidneys before a London Board of Examiners as early as 1871, and got ploughed for my audacity.

In the same year I was asked to see a case of intractable pelvic suffering, of years' duration, which I found to be due to a small pelvic tumour, not larger than a Mandarin orange. I advised its removal, and found it to be an abscess of the ovary; and I cured my patient. Here was another, and, as it proved, an almost inexhaustible field for enterprise. But it was also a new departure, involving for abdominal surgery a new principle. Spencer Wells' rule up to this time had been absolute—nothing was to be done save in face of impending death. Mere suffering was not to be relieved. But I remember that when I was engaged in the practice of general surgery, as I was pretty actively from 1863 to 1870, that I did not hesitate to perform very severe operations for conditions which caused mere inconvenience, such as cleft palate and the removal of lipomatous growths on the back, or wens on the head. I saw a patient die of erysipelas after one of the operations of Taliocotius, and no one uttered a word of condemnation. I could see no reason why there should be one surgical law for the nose and another for the ovary or Fallopian tube; and having found that I could alleviate, or absolutely cure, suffering of the most agonizing kind by removing ovaries and tubes affected by chronic inflammatory disease, I carried out my plan, and it has been followed throughout the civilized world. As experience grew, a constantly diminishing mortality justified the attempts, and now the operation ranks as one of the most successful in surgery.

Uterine tumours for a long time occupied a position which it seemed the army of surgery would never successfully attack; but in 1872 it occurred to Hegar of Freiburg and myself simultaneously, that if menstruation could be arrested by removal of the uterine appendages, the disease might be conquered. On the 27th July 1872 Hegar operated, but his case died. On 1st August 1872 I operated; my case lived; the disease was absolutely cured, and my patient is now in perfect health. Hundreds of cases have since been operated on, and the proceeding has now a universal recognition. The huge sarcous masses, for which hysterectomy alone was the remedy, were removed by me first with a mortality of 50 per cent. This fell to 35 per cent., and is now at 15 per cent.

Keith has been foremost in the success of this operation, and I have no doubt that we shall speedily secure for it results almost equal to those of ovariotomy.

Mixed up with all these proceedings, mixed up with an amount of confusion for which the only excuse is ignorance, is a proceeding of an altogether different kind, to which I have never lent a kindly favour, and to which I am now disposed to offer a strong objection, that which is known as Battey's operation. This is intended, in the words of the author, to bring on the menopause, and thereby indirectly benefit symptoms belonging to the vague and indefinite order known as reflex. I have tried a small number of experimental operations in clearly defined cases, and the want of success has been sufficient to stop me. "Normal ovariotomy" is an operation requiring no skill, little experience, and hardly any judgment, and therefore has been extensively, and, I fear, somewhat indiscriminately practised. I have protested again and again against it, yet many whose voices are no louder against it than my own blame me for it, accuse me of doing it, and generally get confused over the whole subject. I desire once more to say, that save when the seat of such organic disease as will explain genuine suffering, the uterine appendages ought not to be removed; and that those who attribute all the pelvic aches and ails of women to the ovaries and tubes, and rush in to remove them, are dangerous people. I don't say they are dishonest, but I say they are misguided. This kind of laparotomy epidemic is no worse, however, and certainly not more harmful, than the tenotomy epidemic which spread all over the world when Dieffenbach first introduced his brilliant and serviceable operations. Every oblique eye was made more oblique on another axis, and many club-feet were hopelessly destroyed,—results to be deplored, but common enough in all instances of human progress. New things—especially new drugs —are always done to death, and I greatly fear that indiscretion with such a new drug as chloral has done more harm than all the surgical indiscretions collectively.

To turn now to the last and really the most promising phases of my picture. The surgeon has trespassed bit by bit on the precincts of the physician, and I am bound to say a most loyal and encouraging reception he has had.

So long ago as 1745 Jean Louis Petit advised the surgical treatment of gallstones, but it rested till 1878, when Marion Sims carried out the proposal of Petit almost as that great surgeon described it. Sims' case failed, but my first succeeded in 1879; and since then I have done twenty-one in all, with uniform success. Here the argument for exploratory incision comes with perfect clearness and great force. Gallstones is a frequent, but not a very fatal disease. It is, however, accompanied by great inconvenience, and often intolerable agony. I have long since ceased to regard myself as a mere saver of life, for I think the

destruction of pain and suffering is a much higher function. I have found that the mere exploration of the abdomen is a harmless proceeding; and as the diagnosis of gallstones can be made with accuracy only in about 75 per cent. of the cases, we are entitled to construct a rule upon their premises.

Given a case when the symptoms and signs are such as to make the diagnosis of gallstones probable, given the sufferings of the patient to be such as to make him feel equal to facing a 3 per cent. risk (and this is a question for him alone), I say open the abdomen, verify your diagnosis if that can be done; if not, correct it. If the diagnosis is correct, you can cure your patient; if it is incorrect, there is small risk of harm being done. The exploratory incision is the last implement of pelvic and abdominal diagnosis, but it is at the same time the first implement for permanently successful treatment. As a contrast, let me say that in so common an operation as the removal of the breast the conditions are often reversed. The operation treatment is completed, then the exploratory incision is made, only to show the diagnosis utterly wrong.

I have here again been misunderstood and misrepresented, and I want distinctly to insist that I do not wish to make abdominal section take the place of other means of diagnosis or to supplant any, only to supplement all when all these have failed. The percentage of exploratory incisions, like the percentage of incomplete operations, will therefore form elements of great value in judging of the work of any one surgeon, or of the work of this department generally. Both ought to diminish with experience. Amongst my first 1000 cases of abdominal section the exploratory incisions rapidly diminished in successive hundreds. Of the 1000 abdominal sections there were 99 explorations, or nearly 10 per cent. Of 400 abdominal sections which I have done since then, there are only 13 explorations, or only 3·25 per cent., and incomplete operations hardly occur at all.

To what I have already said I need not do more than add a list of extensions of these principles to abscess of liver and hydatid tumours, abscess of the spleen, tumours of the kidney of various kinds, and stones in its pelvis, etc.,—a list of over a hundred cases of very painful and generally fatal diseases brought to a condition of cure with only a loss of two lives.

What I want to conclude with now is a brief speculation as to what we may do in the future, especially with chronic and even acute inflammatory diseases in the abdomen, and with the diseases there of the malignant type. Concerning the latter I again go back to Mr Syme—"What I cannot cure is malignant," and beyond this, in spite of our constant changes of nomenclature, we have never yet got. By dint of constant disappointment we have long since been able to define with considerable accuracy what cases we cannot cure, and amongst them are included certain characteristic

diseases of the stomach, pylorus, intestines, and uterus. Resections and removals for these diseases have become fashionable in certain surgical schools, but I will have none of them. I have done none of them, deterred by Syme's principles—they are not in the interests of my patients. I daresay I might get glory by publishing half-a-dozen cases of resection of the pylorus, and within twelve months I could undertake to provide such a list, for numbers of these cases are sent to me. But in twenty-four months they would all be in their graves, and the art of surgery would have suffered by reason of six useless, unprofitable, unnecessary, and improper operations. Things which cannot be brought under Syme's rules cannot be good for anybody.

Far different from this is the condition of inflammatory disease, whether it be acute or chronic, and if my collective experience has established one conclusion for me more valuable than another, it is that the existence of peritonitis—acute, subacute, or chronic—is the most stringent of all reasons for the performance of abdominal section. It would be a matter of very great difficulty for me to state accurately the number of times I have opened the abdomen in the presence of inflammatory disease, for of course in a very large number of my operations it existed as a condition more or less of subsidiary importance. Thus, in ten of the series of 137 ovariotomies I have alluded to, acute peritonitis was perhaps a greater reason for removing the tumours than the presence of the tumours themselves, for the patients were in the process of dying from the inflammatory disease and not from the tumours, the peritonitis arising from the rotation and subsequent strangulation of the cystic growths. So a very large number of my cases of inflammatory disease of the appendages have had peritonitis, acute or chronic, as their leading feature, and of course it was their great source of danger. It has come to be an axiom with me—accepted now, I think, by every one who practises in this department of abdominal surgery—that the presence of peritonitis, together with some other condition which would by itself involve abdominal section, is the most potent of all reasons for the immediate performance of abdominal section. But if we take cases where there is no other condition present except the peritonitis, which would demand interference, the peritonitis alone is an imperative reason for interference. In cases of the chronic disease associated with suppuration, or with the formation of those caseous masses which have given rise to the name of tubercular peritonitis, the treatment of opening the abdomen, completely clearing out all effusion which can be reached, and subsequently draining the cavity, has met with a perfectly uniform success in my hands in its immediate results, and with a secondary success, that is to say, complete cure of the disease and the establishment of perfect health in at least 80 per cent. of the cases. Let me, as one exception to the scheme of this paper, briefly narrate the story of one case.

E. T., aged 18, was sent to me by Dr M'Carthy of St George's, Wellington, in April 1872. She was thin and emaciated to the last degree, and was hectic, with a night temperature of 38°, and pulse of 126; morning temperature falling to 36°·8, and pulse to 99. The abdomen was distended and tympanitic. She had been seen by Dr M'Carthy on the 2nd of April, having been before that for some time under the care of an unqualified practitioner who had been treating her for bile, as it was said. The following are Dr M'Carthy's notes of the case supplied to me at the time:—

"The condition in which I found her was one of the greatest emaciation. Seldom have I seen a greater, save in the last stage of phthisis. The skin drawn tightly, as it were, over the cheek bones and hollows above the zygomas, the limbs so wasted as to make the bones almost demonstrable for a first year's student. She had been learning the dressmaking, and for that purpose had been in the habit of going to Wellington, four miles from this, every morning, and returning each evening. She had complained of pain in the side of the abdomen, which became more constant, and of great severity. Menstruation had first appeared at the age of 13, and had been regular until a month before I saw her, when she got a severe wetting during her walks about the time the period should have appeared. In addition to the general appearance of emaciation, the abdomen was larger, and the enlargement had been of rapid growth, and this I was induced to regard as being due to some form of malignant disease. The chest sounds and the general visceral indications were healthy; the night temperature was 101°·8; pulse, 120. The chief symptoms were incessant vomiting and diarrhœa."

On my second examination, on the 16th of April, I became perfectly satisfied that the girl was suffering from chronic lymphatic peritonitis, and on the morning of the 17th I opened the abdomen and found it was so. I removed two pints of purulent fluid, and found a large number of masses of flakey, curdy lymph, of which I cleared out as much as I could, and left in a large-sized glass drainage-tube. The drainage-tube was removed on the 24th of April. The wound did not heal, but slowly opened through its whole length, and on the 12th of May large pieces of curdy-like slough, which doubtless were fragments of the hardened lymph which I spoke of, came from the wound, and these pieces went on coming, at a few days' interval, till the middle of June, some of them being nearly as big as half a hand. The wound then began to heal, and the patient was discharged perfectly well towards the end of July, having gained very much in flesh and strength. On the 31st of the following October I happened to be at Wellington Station, changing trains on my road home from a consultation, when I was accosted by a great, strong-looking, red-faced girl, who asked me abruptly if I knew her? I said I had not the slightest

recollection of her face, nor did I know in the least who she was. "Oh," she said, "I am E. T., whose life you saved in April last." She has since remained perfectly well.

The trouble in such cases is this—how to determine the point at which surgical interference becomes necessary; and this, really, is one of the vexed and urgent questions of the moment upon which the physicians present may very profitably favour us with their views. The same point arises again in the cases of obstruction of the bowels—When should the treatment of the physician be subsidized by the appearance of the operating surgeon? The physician naturally cries out against the performance of operations too early. The surgeon deplores the performance of operations too late, and the just middle of the matter can be settled only by the careful discussion of these difficult questions in such assemblies as this. My own idea is that the rule should be that as soon as effusion can be distinctly determined, and as soon as a hectic temperature indicates that that effusion is purulent, abdominal section ought to be performed. One of the most distressing cases with which it has ever been my business to be associated was one in which a most valuable life was lost by what seemed to me to have been most improper delay. The question of abdominal section was discussed in the middle of December, and it was arranged that my friend Dr Keith should perform the operation, on account of the presence of purulent effusion in the abdomen. By the interference of well-intentioned but most mistaken friends, this operation was not performed when it ought to have been. The patient was removed into my own neighbourhood, and within a few days, at the request of one of our most distinguished Midland physicians, I performed the operation, only with the result of finding that I could relieve but one or two of a possibly large number of loculi of purulent effusion. From the history I do not think there can be any doubt, that if Dr Keith had been permitted to perform the operation when it was originally suggested a brilliant success would have been the result. From other cases of a similar kind I have learned the lesson that there is a Scylla and a Charybdis; and whilst I do not desire to steer my bark against the Scylla of the physician, I must earnestly deplore the frequency with which I am wrecked on the surgical Charybdis.

For acute peritonitis I do not think the prospects of abdominal section are anything like so promising; but, out of four operations which I have performed for this disease, I am certain that I have saved two lives, and I do not think I could be contented to allow any case of puerperal peritonitis for which I was responsible to get into a moribund condition before I had cleaned out and drained the abdominal cavity. In such conditions, whether acute or chronic, the abdomen becomes an abscess; and here again I desire to protest against the application of one canon of surgery to the abdomen and another to the cavity of the knee-joint.

If our friends Professors Annandale and Chiene, or Mr Joseph Bell, or any other of the numerous surgeons now present, are called in to a case of suppuration, either acute or chronic, of any large joint, let me ask them if they would not immediately relieve its contents by an incision? The mere extent of the serous surface of the abdomen is no argument against the application of the surgical principle. And now that we have seen our way, by success in less disputable regions, to early interference, with an amount of evidence as complete as can be provided, that the interference itself does but little harm, all I plead for is, that we should be at least permitted by our colleagues who have medical charge of these cases to see what relief in them may or may not be achieved by interfering before a hopeless condition has been arrived at.

The President said that the reception which the meeting had accorded to Mr Lawson Tait's address showed how highly they had appreciated it. They looked forward to an interesting discussion that evening in connexion with his views, which were so far-reaching and so bold, and manifested features of a wholesome conservatism; and the plan which the Council thought best was this, that—as they had a number of friends present—they should request one or two to make remarks, and that the meeting should thereafter be thrown open to those who were willing to give them any observations. He would, therefore, call upon some gentlemen who had been suggested to him at the beginning, and then others would have an opportunity of speaking. The Council proposed to limit the time, and suggested that those who spoke first should not speak more than ten minutes each, and that those who spoke later should confine their observations to five minutes' duration.

Professor Simpson, who was first called on by the President, expressed his gratification at being able to take part at that interesting meeting, where so many of the members of the Medico-Chirurgical Society, and so many of the gentlemen who would form the future members of it and of the profession, had been gathered together to hear the experiences of one of their most distinguished old students —a man of whom he might say, as a statesman said of Palmerston in his day, "we are all proud of him." There was so much to talk about that they had not time to stay in the region of compliments; and he would, first of all, take up the largest question, to his mind, which Mr Tait had opened up to them. That question was, Whether the interference with the abdominal cavity was to be kept in the hands of a few specialists? whether they were, as a profession, of set purpose and from the beginning to say, "some men"—and they could only be a few—"shall have all the cases of laparotomy that are ever to be performed in this Great Britain of ours"—not to speak of the rest of the world? As Mr Tait had stated it, it was a very far-reaching principle, it seemed to him. What held good for the abdomen should hold good for the other regions of the

body; what held good for ovariotomy should hold good for other operations; what held good for surgery, he suspected, would have to hold good for medicine. Now, he believed that the greater proportion of these operations would fall into the hands of the men—and rightly so—who could show themselves to be most successful in the performance of them. But how were these men to begin to be successful? If a young practitioner found himself in contact with a promising case of ovariotomy, was he to say—"Oh, Dr Keith and Mr Lawson Tait never have any mortalities at all, and how do I know but that in this case the woman will die, and then her death will be on my conscience for ever? I think the patient must be taken somewhere else." Under that system there would be no opportunity for a young man to try his hand in cases where he conscientiously believed he could perform any capital operation. That would lead them back to the time of the Chamberlains, now two centuries ago. There was a family of them, who certainly had a power of delivering women in cases of difficult labour which other practitioners did not have. They had the secret of the forceps. He wanted to know if it would be the sense of the profession that they should send all their difficult midwifery cases to men who had skill in an instrument which had been unrivalled? There were some men who had success in the operation of lithotomy. According to Mr Tait's assumption, a surgeon who had a fatal case of lithotomy ought to cease to cut for the stone, and send his patients to some successful lithotomist. Then the principle must be extended further to the field of general medicine. There were some practitioners who had had success in the treatment of diabetes, kidney disease, or whatever else it might be. The general practitioner would have to say, "Am I never to treat kidney disease according to my understanding because some more advanced practitioner has had more success?" He thought Mr Tait had laid down the principle somewhat too broadly; and, further, he was to protest against it in the name of teachers of coming generations. He agreed with something Mr Tait said as to the desirability of having fuller teaching in the two departments that fell under his care—obstetrics and gynæcology. But how was abdominal section to be learned? Mr Tait was not a teacher; Dr Keith was not a teacher. They could not send their graduates to all parts of the country and all parts of the world uninstructed in the technic of these abdominal sections, and it was impossible to give instruction in operative procedures of which one had no practical experience. He was free to admit that no teachers that he knew of had a success at all to compare with that of the two laparotomists he had named, because, perhaps, they had not the time to devote their energies to one single operation. The patients would mainly find their way into the hands of those men who were most successful; but he must claim for teachers the right, when they recognised they had a case they could

operate upon, to operate on it at their own hand, and not pass it away to another man, who may have had a brilliant success. It was an extremely interesting paper which they had heard that night, because Mr Tait had lived through, and had been able to set very clearly before them some of the successive phases in the progress of surgery as to sections through the abdominal walls. It certainly must be to the older members of this Society a matter of great surprise to see the boldness of surgery in the present day, because in it some of the most eager discussions were maintained for long years, in regard to even the justifiability of that operation that led the way to all the others — that of ovariotomy; and he supposed that if some of the surgeons of twenty-five years ago could have been among them now, they could hardly have believed their ears to hear that the abdomen was to be opened, not only for the removal of ovarian growths, but in cases of puerperal peritonitis or inflammatory exudations of the pelvis. And yet none of them could doubt that Mr Tait had presented a fair case for section of the abdomen, even in such cases. He was convinced Mr Tait was giving sound advice when he told them that among such patients there were chances of recovery, and that they might be able to save life that would otherwise be lost. He had himself seen such a case on the post-mortem table, and wished—that was several years ago—that one had opened the abdomen when the woman was still alive, and got rid of the accumulation of pus in the pelvic cavity and Fallopian tubes that was the result of gonorrhœal inflammation. No doubt, in such a case as Mr Tait had told them of, the matter might have been cleared out, and the woman might have had a chance of recovery. Let him ask, in fine, in regard to this operation, what he thought were the important lessons to be learned, and in part indicated in Mr Tait's paper, as to what were the chief conditions of success? He thought that was what they ought to lend their minds to try and discover. He quite freely granted that the greatest stress should be laid on constant experience in handling the peritoneal viscera through the abdominal walls. It had been proved in the experience of operators, even if they had gone through their 500 cases, that the oftener one operated the more safely he operated. But he thought Mr Tait and the ovariotomists should try to lay down clearly before their own minds and of those who followed them in this operation, What were the elements of success in individual cases? Mr Tait mentioned the short incision. There was no doubt he was right. The longer the incision in the abdominal wall the greater was the danger. The second point was the intraperitoneal treatment of the pedicle. There again he was in accord with Mr Tait. The dropping of the ovarian or uterine pedicle into the cavity, so that the wound might be thoroughly closed, was a great element of success. Yet again, Mr Tait spoke of the opportunity of early operation; and he

agreed that too great stress could not be laid on the importance of having recourse to an operation early in any case where they deemed it in the least wise to lay open an abdominal cavity. Another subject he thought Mr Tait might have touched on, namely, the element of rapidity in the operation. The cases which one had most fear of were those where, from whatever cause, the operation had lasted a longer time than usual; where, from the time lost in separating adhesions and securing the bleeding points, the patient had been an undue length of time on the operating table. Every minute on the table, to his mind, increased the chances of danger, and therefore it became important for the more experienced to tell them what expedients had commended themselves to their judgment, to enable them to get quickly through the operation, so that they might try to follow them, at however long an interval, and adopt all the measures that they found most useful for carrying through, as speedily as possible, an operation in which speed meant safety.

Professor Annandale, who was next called on, said he should wish, for his own sake, to thank Mr Lawson Tait for his most interesting address. He should further wish to congratulate him on his success, and to wish him every further success in the important department of surgery which he was connected with. He had had little experience in connexion with special uterine or ovarian surgery, because following that principle of his old master Syme which Mr Tait had referred to, and knowing there was a Keith in Edinburgh, he had always sent his cases to Dr Keith, because he felt that the interests of the patient were better in Dr Keith's hands than in his own. He would like, however, to make a very few remarks on abdominal section in general surgery, more particularly when there was suppuration in the abdominal and pelvic cavities. Now, it was more than twenty years ago since he learned that aspiration and the exploring needle were not to be depended on for the diagnosis or removal of pus from the abdominal or pelvic cavity. He well remembered the case that taught him that lesson. He was asked to go to Fife to see a farmer who was supposed to be suffering from malignant disease in the abdomen. He found him emaciated with hectic fever. On examining the abdomen, there was some dulness in the iliac region, but not very well marked. His diagnosis was that there was some suppuration in the pelvis. He introduced a long aspirator needle and no pus came, rather to the satisfaction of the medical man, who thought he was on the wrong line altogether. He went into the garden and had a walk, and, after consideration, said he was sure there was pus there. "I do not think so," was the reply. Well, he said, if the farmer would allow it, he would explore his abdomen. The farmer gave permission, and he cut into the abdomen. He might mention that he made the incision in the left lumbar region, and having scratched through some adhesions

of the peritoneum, he opened into an abscess cavity containing a renal calculus, and the patient made a good recovery. Ever since that time he had carried out that principle, and he never hesitated in any case where he thought there was suppuration of the abdomen or pelvis to make a free incision and investigate, and generally he had been rewarded with success. He thought it only fair to the Edinburgh School, and he hoped they would excuse him if he seemed rather egotistical, for he was not so personally, but with regard to their School, in order to prove that it had not been behind on this important subject, to refer to a paper which he published in the *Edinburgh Medical Journal* in January 1875. This paper was the result of his own experience of the value of abdominal exploration, and he would give the following quotation from it:—"In abscesses or suppurations occurring in the abdominal or pelvic cavities, or in some of the important surgical regions, the presence or absence of pus cannot always be detected by the exploring needle, and I have on several occasions discovered a collection of pus by an incision, having previously failed to obtain the information by the use of the former means." In fact, he thought they would acknowledge that Mr Tait and himself had been at one for many years in regard to the importance of exploratory incisions, and especially in connexion with abdominal disease. He had never been sorry that he did open into the abdomen in connexion with such cases; but he had been sorry on one or two occasions in which he did not open into it. He had met one or two cases of inflammation in which it was difficult to tell whether the disease was of an inflammatory or cancerous character, and one case two years ago made a great impression on his mind. It had all the symptoms of cancerous disease. He met in consultation several distinguished gentlemen, and they were all of that opinion. He had a very slight doubt in his own mind, but still he was influenced, naturally, by the opinion of the others, and agreed that it was a case of malignant disease, and had to break this sad news to the patient's wife. But it turned out that it was not malignant disease, because the patient recovered. It had been a case of inflammation, and he was now sorry that he did not make a small incision, because that would have decided the matter, and, instead of telling the patient's wife that he would never get better, he would have been able to give a more favourable prognosis. Another important subject was that of section in cases of intestinal obstruction. In regard to these cases he had always made it a practice, in acute cases of intestinal obstruction, that if in the course of twenty-four hours the obstruction was not relieved, he opened into the abdomen, and in many cases he had found conditions that were removed very simply—sometimes a band of adhesions, a twist, or a slight invagination; but, in other cases, he had found conditions that

could not be relieved. But he had never been sorry he did open the abdomen, because the conditions could not have been cured by other means, and were not aggravated by the operation. In regard to renal surgery, they knew this was a subject in which he was much interested, because he had the credit of being one of the first to cut down upon the kidney in order to test whether or not a calculus was present in it. In the first case he did not find a calculus; but the extraordinary thing was that though the patient's symptoms were those of calculus, and he saw the patient with Dr George Balfour, who was also strongly of opinion that there was a calculus, when he recovered from the operation the symptoms were quite relieved, and he thought it always wise to make an incision in cases of suspected calculus when the symptoms were unrelieved by ordinary treatment. Referring to the question of abdominal section in cases of injuries in the abdomen, there was no doubt but that surgeons generally had been too chary of cutting into the abdomen in cases of injury. Last year he had a case of a boy with a pistol shot wound, where there were seven or eight wounds in the intestines. He opened the abdomen, stitched up the wounds, and ligatured a large mesenteric vein. The patient did not recover, but he was sure he put him in a better condition to recover than if he had left him alone. In cases of rupture of the intestine or bladder there could not be a doubt that the best mode was to make an incision, suture the wounded viscus, and carefully sponge out all fæcal or other matters that were likely to cause inflammation.

The President.—In ulcer of the stomach do you advocate that?

Professor Annandale.—Certainly. Before sitting down, the Professor said he wanted to tell an interesting historical incident in connexion with a case Mr Tait had referred to, that as to the condition of suppurating peritonitis. He did not think Mr Tait knew that twenty-five years ago he had operated for suppurating peritonitis; and it was only fair to say that he did not do it on his own suggestion. But it so happened that he was house-surgeon in 1861, and the late Professor Hughes Bennett sent for him one day, and said,—"I have a patient here with suppurating peritonitis—peritonitis caused by a fall from a house—and what I want you to do is to take this man and put him in a warm bath, and tap his abdomen with a large trocar and canula, and, having drawn off all the pus, to take a syringe, when he is in the bath, and inject warm water into his abdomen, until it comes out pure and clear." He did so. The patient did not recover, but he believed now, that if he had opened the abdomen, washed it out, and drained it, possibly the result would have been more satisfactory.

Dr Maclaren, Carlisle, on the invitation of the President, said he should not have troubled the meeting with any remarks, were it not that he thought he could present some facts to them from a different point of view than that of those who were pure

surgeons, or were specially engaged in abdominal surgery. He occupied the position of surgeon in a hospital holding 100 patients, about 30 of whom were patients under his care. For many years he had treated all surgical cases that had come in on his admission days, whether they were abdominal or belonging to any other department of surgery, and he thought it might interest them if he compared the number of abdominal operations with a few of the other grave surgical operations. He had opened the abdomen, to his knowledge—he made that qualification, because in certain pelvic cases he could not be certain whether he had opened the peritoneum or not—twenty-six times: eight of these were for cysts, one for pyo-salpinx—practically these were identical operations; one died. Three operations were done for non-cystic ovaries; three were exploratory; four were for intra-peritoneal abscess; five were for intestinal obstruction; one was for removal of the uterus; and one for a sarcomatous tumour involving the peritoneum. Now, of operations which he would compare with these, he had done amputation at the hip-joint six times; removal of one-half or the whole tongue, four times; of tracheotomy he had not a correct record, but his cases amounted to about thirty (hospital and private). He had opened the bladder three times; of amputations of the thigh, again, he had not quite a correct record, but they were between thirty and forty; for hernia he had operated sixteen times; he had never tied a large vessel in its continuity. He had an object in presenting these figures to them—that was to urge the need for better education in abdominal surgery of all those who were entering medicine. It was his experience, as he had already, on a former occasion, stated to the Society, that when a house-surgeon had to help him with an abdominal section generally the first question he asked was—"Can you give me some book that will tell me something about the operation in view?" As a rule, newly passed men knew nothing about it; it did not matter what school they came from. Looking into the reasons for this, he found that his friend Mr Tait was not a professor of abdominal surgery, but a professor of anatomy to a Society of Artists. Dr Keith, he did not find, was a teacher at all. He was not aware that any of the great London specialists in abdominal surgery taught it. Sir Spencer Wells was formerly a professor of surgery and pathology in the College of Surgeons in London, but it was not in his knowledge that this meant any teaching in abdominal surgery. Therefore, that section of surgery which occupied so prominent a place in the ordinary work of a surgeon was imperfectly taught. In regard to the question of specialism, it seemed to him that it was rather a waste of intellect to discuss much whether these operations should be specialties or not. The inexorable logic of events would decide the matter. He would, however, ask them to remember that operations which in his days

of studentship were only done by masters of surgery, and where he could remember the theatre in the Old Infirmary crowded with students and practitioners, crowded like hiving bees—he had seen them hanging on to the bars which supported the gallery—were now done in provincial hospitals, without any spectators except such of the staff as might drop in in the ordinary work of the hospital. Let specialists look at the matter from the individual point of view. They must remember that this island, and, indeed, the world in general, is fairly well peopled, yet there cannot be specialists everywhere. He himself was not within a hundred miles of one, and if he declined to perform an operation it involved separation from friends and the expense of a distant journey. Moreover, it was only fair to state to them that he knew of two cases in his early days where, if he had been able to say to the patients, "I can perform it with such and such a chance of recovery," they would have submitted to the operation. Not being able to say that, the cases went unoperated on to the grave—cases which were somewhat of a discredit to their profession. They must give honour to all those who have made abdominal operations a great success. They might envy them; and he thought they might ask them to tell freely and fully why they were successful. He would sometimes like to know more than he did know. When he first operated he had only seen one ovariotomy—by Dr Graham of Liverpool—and afterwards he had to make his own experience. Now, what was experience? How far could the results of it be taught? Would specialists tell wherein they differed from ordinary surgeons? Was it simply in the education of sight and touch, or was it in any particular methods? Was it, for instance, the way of using ligatures or sutures? In short, what was the outcome of their experience? He sometimes wished specialists would tell them a little more about such things; so that every man who felt himself competent to undertake surgery, whenever an internal intestinal strangulation came in his way, should be able to cut down on it, see what was the cause, and, if possible, remedy it, and yet subject his patient to no greater risks than such are submitted to at present in the hands of the men who know best about it.

Dr John Duncan, who was next called on, said he rose not because he was hopeful of adding anything regarding abdominal surgery to the brilliant address of his friend Mr Tait, but rather with a view of seeing whether they could not deduce lessons which might be applicable to general surgery from these successes of a small knot of men—most of them, he was glad to say, hailing from this quarter. Of course it fell to the lot of the general surgeon to deal with the peritoneum and the other parts of the body equally. He must take cases that fell in his way, whether hernia or broken leg, although, like Mr Annandale, he might turn over a small class of them to Mr Keith. The first, he would almost say platitude,

that he would submit to them, was that the principles which governed operations in abdominal surgery were entirely applicable to all other surgery; that there might be details in their mode of application which differed, but that the general principles were the same. If they inquired what were those general principles of wound-treatment, they must investigate the causes which made their wounds go wrong—why, in short, did inflammation and fever arise? And the answer to that was exactly the same in abdominal surgery as it was elsewhere—that they might arise from mechanical, chemical, or organic causes. As to the mechanical causes, they might draw one lesson from abdominal surgery. He supposed that the nerve relationship of the peritoneum and the severity of the operations with which these surgeons were concerned brought it about that patients who had been submitted to ovariotomy were in larger number than others brought to the lowest ebb and yet recovered. The severity of the mechanical interference produces a large amount of shock, but shock is an evanescent condition which only proves fatal in combination with other evils. The chemical causes of inflammation, he thought, were only of practical value to them in connexion with the application of antiseptics, and the conclusion they would draw from abdominal experience was, that the less they applied antiseptics to the abdomen or to any wound the better. That was nothing new. That was a principle that Sir Joseph Lister from the very first had enunciated more strongly perhaps than any one else. But, thirdly, they had the organic, and it was in reference to this that he thought their most important lessons might be deduced. He was not going to argue the point; he took for granted the germ theory. He believed, notwithstanding what Mr Tait said—his expressions were a little strong on this point—that they would not soon abolish Listerism; that the antiseptic theory would survive most other theories. He thought they must conclude that the difference between compound fractures and simple ones, between an open wound and a closed one, was the admission of microbia, and if they admitted that, the question was how best were they to avoid the evils resulting therefrom. Well, he put aside as not german to the matter—because, probably, both abdominal and general surgeons were at one as to it—he put aside the after-treatment, and he confined himself to the treatment of the injured during an operation. There were three ways in which they might endeavour to avoid the action of those microbes. One was by operating in purified air. This was ideally the most perfect plan, and Mr Lister had attempted it—he did not think quite successfully. He did not think that the spray did act in that way, but it was possible that either by antiseptic chambers, or in some other way, they might at some future time purify the air. The next mode whereby they might avoid the entrance, through the air, of living germs to the wound was by irrigation. But they

had already spoken of the evil results of the application of antiseptics to the wound. Thirdly, and this he thought the most important deduction from abdominal surgery—they might trust to the germicide properties of the tissues themselves so far as the air was concerned. He thought Mr Tait would agree with him in all probability that the air was the least important factor in the introduction of organisms, that the means whereby chiefly microbes were introduced into a wound were the fingers, the instruments, and sponges of the surgeon. In the next place, the question of quantity was of the greatest importance. The number of microbes that might get into a wound was of the greatest possible importance with reference to subsequent evils. Well, bearing these things in mind, and bearing in mind the results obtained without antiseptics in abdominal surgery, he thought that to trust to the germicide properties of the tissues, not antisepticised, not devitalised by mechanical injuries, was a reliable way of treating all wounds; and of late (his attention being drawn to it by Mr Tait's operations and others) he had been endeavouring to put in practice this principle in the case of ordinary surgical wounds. There was a patient at present in the Infirmary on whom he operated by excision on Tuesday week for disease of the elbow. He had operated before the skin had been broken by suppuration. He applied antiseptics to himself and his instruments, and not one drop of any germicide to the wound itself. He neither used spray, nor irrigation, nor anything else. He was excessively careful to arrest every drop of hæmorrhage. He took special precautions in this way with the view of having the wound absolutely dry. In order to test the case still further, and put it under the worst possible conditions that could be, he then sewed the wound completely up with catgut, without drainage, and covered it with flexile collodion and wool. The temperature had not risen since the operation; there had not been a drop of discharge, and the patient was now, of course, absolutely well. That, he thought, promised to be one of the many lessons which they might learn from abdominal surgery—not that Listerism was to be abolished, not that the antiseptic system was to be done away with, but that the antiseptics were to be applied to the surgeon, and not to the patient.

Dr Halliday Croom said, in common with the gentlemen who had already addressed the meeting, he had listened with very great interest and profit to the very able paper which had been read by Mr Tait, and he took this opportunity of thanking Mr Tait for his kindness to him personally, on his last visit here, in pointing out many details of his operative work which he had not had an opportunity of seeing before. It was impossible for him, of course, with his comparatively limited experience, to communicate anything to that audience of fresh interest in regard to the debate. In reference to the question of ovariotomy, when a surgeon like Mr Tait came there, and told them he had

performed 138 consecutive operations without a single death, he thought that operation ceased to be one for discussion. He could not see any room for discussion; it was not a question at all. The point was settled; it was a recognised operation; and although there might be details cropping up from time to time, the question of operation was settled once for all. Another question, to which he thought, however, Mr Tait had not directly alluded, was the removal of the ovaries with the view of arresting hæmorrhage and bringing on retrogressive changes in fibroid tumours of the uterus. He had seen Mr Tait perform the operation on a patient of his own, who had bled every week for two years. Some time in December Mr Tait had operated on this patient and removed the ovaries and tubes, and since then the patient had not lost more than a teacupful of blood altogether. He thought, as Mr Tait had omitted to speak of this operation, that he should like to draw attention to the extreme importance of removing the ovaries and tubes in these cases, because it seemed to him, from what he had seen in practice and in the hospital, that a great object would be gained for their patients if they recognised fibroid tumours earlier, and removed the ovaries when yet the tumour was small and in the pelvis. When they were allowed to grow and extend into the abdominal cavity the removal of the ovaries became a very serious and dangerous operation. He would like, further, to say a word in regard to the operation to which Mr Tait had specially attached his name—the removal of the uterine appendages where there was inflammatory conditions. Two questions he would like to ask—first, How he diagnosed those cases? Did he take his diagnosis from the following symptoms—that the patient had suffered from pelvic distress, that she had profuse menstrual discharge, that that discharge was accompanied by pain two days before the onset, and that she had pain on coitus. Did he make his diagnosis from that, or from what he felt in the pelvis, from signs? If so, then he wanted to ask Mr Tait another question, Did he do, as he had himself seen him do, when he had the pleasure of seeing him in his ward with Dr Imlach of Liverpool. He showed them three cases of what was supposed to be diseased tubes. Both Mr Imlach and Mr Tait examined the patients, with one hand only, while the other was somewhere else—in the pocket, he thought. He introduced two fingers and said, "This is a case of tubes." Now, if there was one thing they as teachers had insisted on in Edinburgh, it was that no satisfactory examination of a woman's pelvis could be made except it was bi-manual. He asked how it was possible even for Mr Tait, with his vast experience, to know what was in a woman's pelvis with one hand in the vagina and the other somewhere else. Mr Tait had revolutionized many things in surgery, and had knocked down some. Was the bi-manual examination one of these? Another point on which he should like to ask a question was, Where was the limit to these operations? Where did

Mr Tait draw the line at in removing tubes and ovaries for disease? It would be a very great advantage to those of them who were teachers if they were able to say definitely what were the cases in which this operation should be performed. For instance, he had under his charge two young women of about 27 years of age. Both had been married three or four years, and these women had both acutely inflamed and prolapsed ovaries. They suffered pain at menstrual periods; they had pain on coitus, and were sterile. He was not at all squeamish or sentimental on the subject of unsexing women, but at the same time he would hesitate before he sanctioned the removal of these women's ovaries under these circumstances. Therefore, he thought, they should have some light on the subject. Was it right, when a woman presented herself suffering from pain at her periods, and something was felt within the pelvis, was it right to make an incision for diagnostic purposes, and if necessary to remove her ovaries and tubes? Again, how long must a patient suffer before one had to interfere to take out the ovaries and tubes? Another remark occurred to him to make on the subject. He could only wish to endorse what had fallen from Professor Simpson and Dr M'Laren, namely, that Mr Tait was rather hard on those of them who were what was called obstetric physicians, when he said they should never perform these operations. Was it because the operation could not be so well done? Possibly it might be so. For his part, he thought Mr Tait and the so-called ovariotomists assumed too much. He saw no reason why an ordinary physician in charge of gynæcological wards—what is known as an ordinary obstetric physician with due experience—should not perform abdominal section with equal success. He could see one objection, namely, that obstetrics was an uncertain department of practice; that one might be called on a certain day to perform an abdominal operation of extreme severity, requiring all care and attention, and might have lost a night's sleep the night before, and not be in the best condition to apply his mind or hand. But the same would apply to Mr Tait if he travelled from Birmingham over night, and had to perform the operation here. Was it in the interest of the parturient woman that Mr Tait objected? Surely, with the observance of careful antiseptics, no possible harm could come to the parturient woman. At any rate, the argument told quite as much the other way, for Mr Tait might have to deal with a cancerous mass, from which it was most difficult to disinfect one's hands, and perform an ovariotomy shortly afterwards, *without any antiseptic precautions whatever*, and according to his own showing he had practically no deaths at all.

Dr Imlach, Liverpool, then said—When he was honoured with an invitation to take part in this discussion he accepted it chiefly that he might hear what Mr Lawson Tait, Dr Keith, and other great authorities on abdominal section might have to say. Un-

fortunately Dr Keith had been unable to be present, but from Mr Tait we have had a vivid and memorable *résumé* of a very difficult and complex subject. Abdominal section extends beyond the domain of gynæcology, which is by no means a purely surgical art. In the Liverpool Hospital for Women, to which he was attached, he found that out of 3500 women suffering from what might be briefly termed diseases of the womb, less than 1 per cent., only 0·7 per cent., required surgical treatment, even of the simplest character; and in Birmingham Hospital and similar institutions a like proportion obtained. The anxiety accompanying the performance of abdominal sections seems to loosen the tongues of some, though it renders others silent, and a large amount of minor gynæcology involving no surgery is got through by most of them without discussion. Mr Tait had led them through the intricacies and varieties of abdominal section, and now that he had been asked, through the courtesy of their President, to speak, he wished to point out the unlooked for promise of utility in some and the disappointing results in others. The surgery of the liver and gall-bladder was accepted by all as safe in execution and brilliant in its results, but the surgery of the intestines, in some of its aspects, was still rudimentary, doubtful, and obscure. Physicians hoped that when a typhoid ulcer had perforated the intestine the surgeon might be able to discover its locality, stitch up the rent, wash out the peritoneum, and save the patient; but, unhappily, it was difficult to find the ulcer, and as, when intestinal contents have entered the peritoneum, death is not due to peritonitis (of which there was often but little sign), the wisdom of surgical interference was dubious. In excision of the spleen for tumour and leucocythæmia surgery had also failed to establish its value. He had consulted nearly twenty text-books upon this subject, and the physicians all admitted they could do little or nothing. Such tumours were not very common; if each author had watched five, there were one hundred cases treated without a single cure having been effected. They looked to the physiologists to help them out of that humiliating dilemma. In the surgery of the female genito-urinary system the renown of ovariotomy and its successes were pre-eminent. It needed no expert to inform the public that an ovarian tumour, if left alone, was almost inevitably fatal; and once assured by the work of Sir Spencer Wells, of Dr Keith, of Mr Lawson Tait, and others, of the safety of ovariotomy, its acceptance by the public and by the profession was universal. But inflammation of the bowels, to use the popular phrase, and its sequent troubles were more difficult of apprehension, and not even the life-long work of Bernutz had settled the part played in the etiology of these painful and dangerous conditions by the inflammatory and suppurative diseases of the ovaries and their ducts. Until the pathology of Bernutz had been apprehended by the public, and acquiesced in by the medical profession, the proper treatment of that class of cases

would probably continue to be the subject of scientific discussion. The surgery of the kidney had been far more successful than could have been anticipated. Thornton, Tait, Morris, Lucas, and others, have shown that nephrectomy might yet outrival ovariotomy, and that suppurative and calculous kidneys admitted of satisfactory surgical treatment. Within twelve months he had removed a sarcomatous kidney, thoroughly emptied and drained a hydatid kidney that was as large as the uterus at full term, emptied and drained a renal abscess that was nearly as big, and removed a renal calculus. All had done well, and in the only case where he refused to operate, the right kidney being an enormous cyst with numerous calculi, the left kidney was shown at the post-mortem examination (as he had anticipated) to be no larger than a hazel nut.

Dr Berry Hart said he rose merely for the purpose of getting some information from Mr Lawson Tait, as they had him there that night. The first thing he would remark on was this—he thought it was to be deprecated that, in the cases with which Mr Tait's name was associated, they should operate from symptomalogy, and not from physical signs. There was also a class of cases where the mischief spread through the connective tissue, and these would not be so favourable for operation as those where it passed through the Fallopian tubes. He was afraid that if they limited the examination of patients to symptoms, they would lose a great deal of information. He should like to know how the removal of the appendages benefited where there was peritonitis, and whether Mr Tait held that the removal of the ovaries and tubes exercised some influence on the nervous system. The last point was in relation to Listerism. He did not think Mr Tait had altered the principles of Listerism by his work, but he had shown them that they could carry out these principles by the sterilization of their instruments. For instance, from Koch's experiments, they knew now that boiling was perhaps the best way to render any subject aseptic; and a surgeon, by boiling his instruments and washing his hands thoroughly clean, carried out Lister's principles. And it was possible they had been wrong in carrying out Listerism by using such strong antiseptics.[1] In conclusion, he expressed the

[1] During the debate I spoke inadvertently of boiling sponges as a means of disinfecting them. Mr Tait has kindly forwarded me the following description of how he treats his sponges :—

"New sponges are first put into a large quantity of water with sufficient muriatic acid to make the water taste disagreeably acid. They remain in this mixture until all effervescence has ceased and all the chalk is removed. For this purpose it may be necessary to renew the acid several times. The sponges are afterwards carefully and thoroughly washed, to make them a s clean as possible, and free from every rough particle. After being used at an operation, they are first washed free from blood, and then put in a deep jar, and covered with soda and water (1 lb. of soda to 12 sponges). They are left in this about 24 hours (or longer if the sponges are very dirty), and then they are washed perfectly free from every trace of soda. This takes several hours'

great pleasure with which he had listened to Mr Tait's opening address, and the very great benefit which they had all experienced from his writings.

Dr Cotterill said he would not have presumed to interrupt the discussion, but that he was in possession of an interesting specimen, which he thought Mr Tait and others interested in abdominal surgery might be glad of an opportunity of seeing. The case was admitted to the Infirmary a few nights ago, and showed symptoms of acute intestinal obstruction. There was peritonitis, accompanied with fæcal vomiting. A tumour could be felt per anum, and a diagnosis of volvulus made. After the administration of chloroform this state of matters was apparently improved, and the patient had a fæcal evacuation; but the symptoms returning, Dr Cotterill performed abdominal section, and in drawing up the colon was aware of something like a band giving way. This was followed by another fæcal evacuation. There was a solid tumour in the pelvis fixed to the pelvic walls, presumably a sarcoma. Perforation of the gut had taken place, and there was fæcal matter lying in the peritoneal cavity and evidences of local suppurative peritonitis. The patient died eighteen hours after, and at a post-mortem examination this unique state of matters was discovered:— There was, at the lower end of the sigmoid flexure, an annular tumour, two inches in breadth, surrounding the gut, and situated five inches above this a tumour, which he believed to be a papilloma, attached to the mucous surface by a pedicle about five inches in length. The tumour was then very much larger than they saw it now. During the act of evacuation, two days before death, this had come down and acted as a plug, with the result that the sarcomatous tumour had given way, and the patient had suffered from perforation of the intestine and peritonitis.

Dr Byrom Bramwell said that, as Mr Tait had well remarked, the section of the abdomen was a territory on which the physician and the surgeon met; and he hoped, therefore, it would not be thought out of place if he made one or two remarks with regard to that particular part of the subject which related to the physician. He would like, in the first place, to ask Mr Tait for the reasons which had guided him in coming to the very strong conclusion which he had expressed with regard to operations on cancer of the stomach—he alluded, of course, to the operation on cancer of the pylorus, putting out of account tumours which in-

hard work, using hot water, squeezing the sponges in and out of the water, and changing the water constantly. Leaving them to soak occasionally for a few hours in very hot water greatly assists in the cleansing. When quite clean, they are put into a jar of fresh water containing about one per cent. of carbolic acid, and, after being in this for 24 hours, they are squeezed dry, and tied up in a white cotton bag, in which they are left hanging from the kitchen ceiling (being the driest place in the house) till they are wanted."

volved the body of the stomach or the cardiac orifice. Cancers of the pylorus might be extremely limited. We all know that medicinal treatment affords no hope of cure, and hence it had occurred to surgeons to remove the pylorus. Now, he understood Mr Tait to object to this operation because it was for cancer, not because of the difficulty or danger of the operation itself. Mr Tait's brilliant results had shown that it was almost as safe to perform an operation in the abdomen as it was on an external organ, so far as any risks of a fatal result from peritonitis was concerned. Now surgeons, he took it, would hardly agree that all cancers—as cancer of the breast for instance—were not to be touched. That was a proposition which he supposed would hardly be admitted, and if the success of ovariotomists had shown that an operation in the abdomen could be as successfully performed, was it not right under such circumstances to place the chances for and against the operation before the patient for his decision. Would it not be right, therefore, if they were to operate on cancer at all, to operate in such a case as that, or at all events to give the patient the benefit of the doubt? He certainly would live for some time if they did not operate; but many people rather than die a slow and lingering death would run the great risk of this operation. He asked this question as seeking for information, not as an advocate of the operation, because it was occurring every now and again to physicians. In regard to intestinal obstruction, that, as Mr Tait had said, was an extremely difficult matter, which no one felt he could give any general rule about. He was disappointed that Mr Tait had not given them the rules which guided him in forming a decision on this matter. Mr Tait said they should operate when there was evidence of purulent fluid in the cavity of the abdomen. But, as matter of fact, in cases of obstruction it was seldom that they could detect such in the cavity; and if that was the only rule—

Mr Tait.—That I said of suppurative peritonitis, not of obstruction.

Dr Byrom Bramwell said he would much like to know what were the rules which guided Mr Tait's procedure in these cases. Professor Annandale had said he would operate in acute cases where the symptoms lasted over twenty-four hours. He took it that in many of these cases the surgeon was called in after the physician had seen the case in all its stages. For his own part, he would, speaking generally, hesitate to recommend the operation if the obstruction had only lasted twenty-four hours, and if the ordinary medicinal remedies (opium and belladonna) that they knew in many cases were successful had not been tried. What seemed to him the great difficulty in many of these cases was the question of diagnosis; they could not put all the cases together and lay down any definite rule applicable to them. One had to make careful inquiry into the history and the circumstances of the case, and endeavour to

determine what was the special cause of obstruction in each instance, and to be guided by that in forming his opinion. A case occurred, for instance, in which a man had been afflicted with malignant disease where there had been no symptoms. He was suddenly seized with obstruction, and perhaps died of peritonitis. He had known such cases, thought to be due to a band or some other mechanical cause. When a patient came before one *in extremis*, more especially in the hospital, and in cases in which there were no friends, it was not always possible to elicit all the facts; it was the difficulty of diagnosis that one had to contend with. As Professor Annandale had suggested, would it be right under those circumstances to attempt an exploring incision? He could not pretend to give any opinion, but he had always hitherto been under the impression—it was perhaps considerably changed by hearing of Mr Tait's brilliant works that night—that to open the abdomen in cases of acute obstruction was one thing, and that to open a healthy peritoneum was another. He should like to ask Mr Tait whether he advocated the opening of the peritoneum in these cases; whether he would expect to get the same results as in ordinary cases; whether there would not be special difficulties and dangers? Then there was another point which Dr Imlach had alluded to—the operation for perforating ulcers of the stomach, for removal of leucocythæmic spleens, and other cases of a similar kind. The great difficulty that a physician had in recommending, or a surgeon in performing an operation, was that when he was called to see the patient he was, in cases of perforation of the stomach, in such a state of collapse that the chances were that if the abdomen were opened the patient would die on the table. The same argument held in regard to leucocythæmic spleen. It was only in the last stages that surgeons had attempted to remove the tumour, when a slight loss of blood was of great importance. Possibly the brilliant operation which Duncan and Cotterill and others had performed of injection of blood had removed this source of danger; and it seemed to him to be the question for the future, whether in cases of perforated stomach or enlarged spleen it might not be possible, having infused blood and done away with the chance of collapse, to treat these cases more successfully than hitherto had been the case.

Dr Affleck said he wished only to interpose in the debate for a very few moments, to refer to one point which Mr Tait had invited the attention of physicians to, and which had been alluded to by Dr Byrom Bramwell, in regard to surgical interference in cases of intestinal obstruction. He agreed in the main with Dr Byrom Bramwell, but there were some points he wished to particularize, on which he held, perhaps, a slightly different opinion. The cases of acute intestinal obstruction were very varied, and the difficulties in diagnosing very great; and they knew there were forms which were remedial by very simple means,

and other forms that, humanly speaking, were incurable, except by interference on the part of the surgeon. The question was, When could that interference be advantageously undertaken? Even some of the most formidable forms of intestinal obstruction might right themselves. A twist of the bowel might relax itself; it was possible that the portion of an intestine getting into a band might get out of it again. Therefore, surgeons were very properly unwilling to interfere until the time when it was clear that no efforts could remove the difficulty. He spoke in reference to a case in his own ward, within the last fortnight or three weeks, of acute intestinal obstruction, where an abdominal section was made, but made, he thought, too late. The case was treated by the medical man and himself outside; and after all ordinary means had been used to try and get relief, he came to the conclusion that there was in all probability a band or other source of mechanical obstruction, and took her into his ward to have her examined by a surgeon, with the view and hope that the operation might be promptly performed. The case was seen by two of his colleagues, one of them being Dr Keith. There was some debate on the case, and several doubts arose. The temperature began to rise; the pulse got quick; signs of peritonitis set in. The operation was well performed. Two bands were found—one on the large, and one on the small intestine—which were cut, and the patient had an evacuation after—but died, apparently from the shock. He thought the operation had been too late, for if peritonitis set in in a case where intestinal obstruction seemed to be acute, and if to that was added the shock of an operation, the chance for the patient was a very slender one. He thought the time to interfere was before peritonitis set in, and the great difficulty was what Dr Byrom Bramwell had pointed out. He thought that after due consideration and exhaustion of the ordinary methods to remove the difficulty, when the conclusion was formed that it was in all probability a mechanical obstruction, no time should be lost in making an exploratory incision with the view of removing the obstruction.

Dr Foulis said that in the *Edinburgh Surgical and Medical Journal* for 1846 there was described an operation for ovariotomy performed by Dr Handyside in presence of Dr Hughes Bennett and several other gentlemen. This operation was performed on 5th December 1845 by Dr Handyside. The patient lingered on for seventy days, and died at last. She was a young girl of 21 years of age. He believed that was one of the first operations for ovariotomy ever performed in Edinburgh. But the point he wished to look at was this, that having described the operation and after-treatment of the case, Professor Hughes Bennett stated that in sewing up the abdomen, great care was taken *not* to include the peritoneum in the sutures. From that day to this enormous changes had taken place in the treatment of the peritoneum. No

one feared to handle the peritoneum in the most violent manner, and he ventured to say that a deal of the success commenced from the day that people took care to include within the sutures the peritoneum. There were one or two points as to tumours that he should like to bring before Mr Tait. One of the first disagreeable facts as to ovariotomy was that many of the patients who recovered returned in the course of one, or two, or three years suffering from malignant peritonitis, and Dr Thomas Keith was the first to state that he was almost disheartened from the study of ovariotomy, by the fact that many of the patients died of cancer within eight or ten years from the time of the operation. Why was that? Mr Tait had hit the nail on the head when he said that the secret of success lay in performing the operation as soon as it is possible to detect the tumour. The old plan was to leave the tumour to as long a date as possible, until the abdomen got quite accustomed to the tumour, and then operate. Had they any method of recognising the malignancy of abdominal tumours? He believed Mr Tait would bear him out in saying that almost every malignant tumour was surrounded by ascitic fluid. He was the first to point out in the *Edinburgh Medical Journal* the importance of examining the fluid microscopically before operating. If the tumour was allowed to grow to a large size, there was great danger of malignancy. There was such a proliferation of the connective tissue elements in the ovarian stroma, that the tumour might burst and the connective tissue elements might turn into sarcomatous elements, and affect the peritoneum, otherwise healthy. Hence the importance of recognising the nature of the tumour as soon as possible, and removing it. If, on tapping, the ascitic fluid was found to be bloody, it aided very much the question, whether malignancy existed in the abdomen. He believed a microscope would discover whether malignancy was there or not. He maintained that a careful microscopic examination of the fluid would enable a surgeon to avoid that very unfortunate result which so frequently happened after attempting to remove a malignant tumour of the ovaries. He would have great comfort from hearing Mr Tait state his views as to the question of the ascitic fluid surrounding the abdominal tumours.

In reply, *Mr Lawson Tait* said that he thought the best plan would be to take the points in the reverse order of the speakers. He would at once dismiss what Dr Foulis had said by expressing an entire concurrence in his view. There could be no doubt at all that the delay in the performance of ovariotomy favoured the recurrence of cancer after the operation, and that when ascitic fluid was found outside an ovarian tumour it meant one of three things,—the first, and by far the most probable, being cancer; and the second and third, of much less frequent occurrence, being either a rupture of the cyst, or suppuration of the peritoneal cavity. Dr Bramwell had asked for detailed reasons for Mr Tait's

views against operations for cancer. This was very much too large a subject to go into, but he could only again express the belief already given at some length in the paper, that operations performed for diseases which preclude anything like permanently successful results were not such as redounded to the credit of surgery, or the advantage of the patients. Dr Bramwell had asked Mr Tait for rules to govern surgical interference in cases of intestinal obstruction, but that was precisely the question which Mr Tait had been asking Dr Bramwell and his fellow-physicians, as to whether it would not be possible for the men who were charged with these cases early in their progress to come to some kind of conclusion by which they could be guided towards permitting the interference of the operating surgeon. Dr Berry Hart and others seemed to have got a wrong impression about Mr Tait's method of dealing with his sponges. He certainly never boiled them, for boiling a sponge ruined it, and sponges were a very costly item, particularly in his line of practice. He could perhaps answer Dr Berry Hart and Dr Halliday Croom in the same way concerning the symptoms and signs by which he was led to interfere in cases of chronic inflammatory disease of the uterine appendages. He certainly was always extremely loth to interfere unless he could obtain absolute evidence on physical examination that the disease was local, and thereby justifying the view that the symptoms were not merely of a general and purely subjective kind, and this he rarely found much difficulty in ascertaining by the single finger examination. It is perfectly true that from time to time it became necessary to use the bi-manual method, and even an anæsthetic, but these were the doubtful cases. Unless completely assured by a responsibility shared with other people to assure him that everything was done to protect the patient, he did not operate in the absence of physical signs; but, of course, it must not be forgotten that in this, as in every other department of medicine and surgery, the patient must have some kind of vote in the matter, and, therefore, he always carefully explained to his patients what conditions were probable in each case, and what might be done to alleviate them; and the patients, in every instance, had the choice as to what method of treatment should be adopted. In such a line of practice as his, this kind of proceeding was essential, for there were many patients who would rather go on suffering than take any kind of risk; whilst on the other hand there were others—and by far the more numerous class—who would submit to anything like a reasonable risk for the sake of getting rid of perpetual ill-health. It was in this way that he could answer Dr Croom's question as to where he drew the line. The line was not drawn by him; it was drawn by the patient and her friends and advisers in each individual case, and it must not be forgotten that this line was a movable thing, the social condition of the patient governing the position of the line in a very remarkable

way, for an operation which was hardly to be justified in the upper ranks of life might become an imperative necessity in the case of a governess or a servant girl. He was delighted to find his old friend Dr John Duncan had come to a conclusion pretty much the same as his own; and although he differed from Dr Duncan when he said that Listerism would never die, really Dr Duncan had succeeded in slaying Listerism completely that night. He had apparently given up all belief in aerial germs, and regarded only germs that could be carried into the wounds by the surgeon's own fingers and instruments. This, doubtless, was a great step in advance, for we had long been blaming outside conditions when really the blunders were to be laid at our own door. This was a new kind of *ism*, which he would venture to call *Duncanism*, and it very much resembled what for years he had practised, which might be called *Taitism*. The questions raised by Dr Maclaren and Professor Simpson were of extreme interest, but he was bound to say that he approached them with a considerable amount of hesitation, for being in a position of a purely special kind, whatever opinions he might express would always be regarded as based in that direction. But he could not help feeling that in his own case an enormous mass of material was being wasted, as far as purposes of instruction were concerned. He had very few pupils, and in the ordinary sense of pupils he certainly did not desire to have them, for it would be perfectly impossible for him to undertake to devote his time to the teaching of the elementary facts of gynæcology, and to teach a large number of students the advanced practice of that department of our art was throwing instruction away. He supposed that every year the University of Edinburgh turned out about 200 graduates, and he ventured to say that to 180 or 190 of these such practice as he was engaged in would never be of any kind of value at all. To the other ten or twenty it might, on the other hand, become the object of their lives. What was really wanted for instruction in specialism was the construction of a post-graduate school. Such a school might be partly situated in Edinburgh, partly in London, and partly in Birmingham, or elsewhere. It was perfectly certain that what was wanted was a co-operation of leading men in the various specialties of medicine and surgery, by which such pupils as desired to have a complete, or more or less complete, course of instruction in any of the specialties might secure what they wanted. As matters stood, it was only possible for a man after his graduation to receive pupil's instruction, whilst he wanted much more; whilst, on the other hand, it became a matter of necessity for each general practitioner to undergo a systematic course of instruction in specialisms which he would not use except to a very limited extent. The kind of specialism required by the general practitioner was merely the selection of a limited number of striking features upon which most serious blunders might be made; such, for instance, and very

often in discussing the question Mr Tait had taken this as a brilliant example, the symptoms of acute glaucoma, a point upon which but few months pass in the practice of any ophthalmic surgeon without some terrible mistakes being met with. In conclusion, Mr Tait need not say that the gratification which he experienced from the magnificent reception which he received, from the kind allusions to his own work, and from the brilliant assembly before him, was altogether too great for utterance in words.

The President of the College of Surgeons then said he rose not to take part in the discussion of abdominal surgery, in which case he would be entering on a subject which was entirely out of his sphere, but, on the other hand, to ask them to accord a most hearty and cordial vote of thanks to the College of Physicians for the use of their hall for that meeting. That large meeting which had gathered to hear the address of Mr Tait would have been very insufficiently accommodated in the hall in which the Medico-Chirurgical Society usually met, and he was sure much of the pleasure which they had enjoyed that evening would have been lost there, for they would have been inconveniently seated on hard chairs and overcrowded, and would with difficulty have heard the interesting address, and not less interesting discussion by which it was followed. Therefore, he called them to cordially pass a vote of thanks to the College of Physicians for the use of their elegant and commodious hall for that meeting.

Dr Littlejohn seconded the motion, which was carried with enthusiasm.

Meeting VII.—March 3, 1886.

Professor Grainger Stewart, *President, in the Chair.*

I. Exhibition of Patient.

Mr A. G. Miller exhibited a woman, upwards of seventy, who had recovered with a useful arm after a severe compound fracture of the ulna, complicated with a fracture of the surgical neck of the humerus. The injuries had been inflicted a fortnight before admission to hospital. The wound was putrid, and there was no attempt at union of the fractures. Mr Miller scraped the wound of the soft parts, removed portions of the ulna which were necrosed, and scraped out the medulla. The resulting raw surface, which was considerable, was dressed antiseptically, and healed rapidly. After six weeks the wound was healed and the humerus soundly united. The patient was shown three months after the injury, with the limb capable of performing all its movements fairly well.

II. Exhibition of Pathological Specimens and Demonstrations.

1. *Dr Noël Paton* showed a specimen of A LARGE GLIOMA growing from the upper surface of the cerebellum, chiefly from the left side, but extending over to the right side. The tumour extended from the anterior to the posterior border of the cerebellum, and extended deeply into the organ, destroying nearly one-half of its substance. Sections of the tumour exhibited under the microscope showed it to be composed of round cells with large single and double nuclei. The patient was a teacher of the piano, who had been ill for seven months before his death. His first symptom was a failure, after playing for some time, to properly co-ordinate the fingers of his left hand. After walking for long, his gait became somewhat unsteady. Throughout the early part of his illness he had no other sensory or motor symptoms, except severe fits of headache accompanied by vomiting. The fundus of the eye was normal. In the later part of his illness he suffered from squinting, from severe orbital neuralgia, and from epileptoid fits. Dr Noël Paton suggested that the slightness of the symptoms pointing to the implication of the cerebellum was due, firstly, to the comparatively slow growth of the tumour, and, secondly, to its implicating both sides and the anterior and posterior parts of the cerebellum about equally, and referred to Ferrier's conclusion in regard to such symmetrical lesions of this structure in confirmation of this explanation.

2. *Dr Byrom Bramwell* showed—(1.) A series of MICROSCOPICAL PREPARATIONS, DRAWINGS, and PHOTOGRAPHS, illustrative of a remarkable lesion of the nerve centres in leucocythæmia. Numerous hæmorrhages, varying in size from microscopical extravasations to large masses of blood the size of a hen's egg, were scattered through the brain tissue. The bloodvessels throughout the nerve centres were enormously dilated and distended with white blood corpuscles. (The case is reported and the specimens figured in the *British Medical Journal*, 12th June 1886, page 1098.) (2.) A series of MICROSCOPICAL PREPARATIONS and DRAWINGS illustrative of calcareous degeneration of the cerebral bloodvessels (a detailed account of which appeared at page 1, vol. xxxii., of the *Edinburgh Medical Journal*). (3.) Two specimens of ANEURISM OF THE LARGE ARTERIES OF THE BRAIN, which had ruptured and produced meningeal hæmorrhage. (A detailed account of these specimens appeared at page 4, vol. xxxii., of the *Edinburgh Medical Journal.*)

3. *Note by Dr Woodhead on Dr Bruce's demonstration of Weigert's method of embedding and staining nerve centres.* —

Dr Bruce, in his demonstration of Weigert's[1] method, pointed out the disadvantage of not being able to obtain serial sections by the celloidin method. In a recent paper Professor Weigert gives a method of mounting these celloidin embedded preparations in regular serial order, which is not only extremely useful, but may also be carried on with great ease and rapidity. The same method is even more convenient than the usual method for mounting ordinary sections. Glass plates of any size, according to size and number of sections to be mounted, are coated with photographic collodion (as for wet plate photography). They are then reared up against some object, and allowed to dry with the collodion side downwards. When dry these plates are ready for use. Slips of toilet paper (closet paper), about twice as broad as the sections, are then prepared. Commencing at the left margin one of these slips is placed lightly on the sections as they are cut, each succeeding section being placed to the right of its predecessor. Should the sections be curled up at all they are flattened out with a camel hair pencil moistened in spirit. The knife is also kept *slightly* moistened with spirit, any excess being allowed to run off from the tilted knife or taken up with a piece of blotting paper. As many sections as can be mounted on one glass are taken on the slips of paper (but there should never be more than a single row of sections on each slip). The slips are kept moist, until they are to be used, by placing them on a sheet of blotting paper in a flat dish containing spirit, great care being taken that none of the spirit gets over the surface on which the sections are laid. In laying them down on this plate, the first row is placed furthest away with the first section at the left side, so that the succeeding sections follow on like words in a page of a book. These rows of sections are then placed on the prepared collodion plates (never more than one or two rows on each plate) sections down, the paper thus forming a covering. Gentle pressure is then applied to the paper over each section, after which, if it has been kept sufficiently moist, it can be pretty easily stripped off from the plate, and the sections are left in position adhering to the collodion. Any superfluous spirit is carefully removed with blotting paper. When the sections are quite dry another thin regular layer of collodion is poured over the sections, the plate is again tilted, and allowed to dry. The number of the row, etc., is marked with a pencil dipped in methyl blue, as soon as the collodion is dry. They may then be placed at once in the staining reagent, or if this is not convenient, they may be kept in 80 per cent. alcohol. When placed in the hæmatoxylon the film separates from the plate, which may then be removed from the staining fluid.

[1] "Ueber Schnittserien von Celloidinpräparaten des Centralnerveusystems zum Zuercke der Markscheidenfärbung." Von C. Weigert in Frankfurt, A.M. *Zeitschr. für Wissenschaft. Mikroskopie u. f. Mik. Technik*, Bd. ii., 1885, pp. 490–495.

The sections take on the stain exceedingly well. The after-treatment is as usual, but great care must be taken to wash the sections thoroughly (at least an hour in water frequently changed). The sections are trimmed under water with a pair of scissors, or the films are floated out on toilet paper and then trimmed. The trimmed films (without the paper) are then placed in 90 or 96 per cent. alcohol (*not absolute*), after which they may be manipulated freely and placed on the slide. The sections are cleared up with kreosote or with benzin and alcohol, in which fluids they must be left for a considerable time, in order that the collodion may be cleared up. The sections are then mounted in balsam and labelled.

4. *Dr Woodhead* exhibited the KIDNEYS OF A YOUNG MAN, æt. 23 (a case of Dr G. A. Gibson's), with a somewhat peculiar history. Eighteen months before death the patient consulted Mr Miller for pain on micturition and turbidity of the urine. The urine was analysed by Dr Gibson, who found that it contained pus and blood. Under treatment the patient improved for a time, but his condition was complicated a few months later by stricture of the urethra. For this he was treated by Mr Miller in the Royal Infirmary. He was cured of this, and remained in tolerably good health until about two months ago, when he began to fall off, but it was not until ten days before death that he felt really unwell. He was suddenly attacked by severe vomiting, which persisted in spite of all remedies, and was followed by convulsions and coma. At the time of his death the urine was highly albuminous. Both kidneys were reduced to mere shells bounding large caseous masses. The left was simply a series of soft pultaceous or soft clay-like masses bounded by an extremely thin wall. The right ureter was somewhat dilated and its walls thickened, but there was no evident tubercular process except in the immediate neighbourhood of the bladder. Left ureter was reduced to a cord, with soft caseous material filling the lumen. The bladder presented a very interesting appearance. In the mucous membrane there were numerous gray miliary tubercular nodules, extending over whole surface, but most numerous at the base. Caseation not at all marked in these minute nodules. In the prostate there was a small cavity about the size of a hazel nut with smooth walls, but with a few strands of muscle projecting. It appeared to be either the urethra dilated for a short distance in the substance of the prostate, or a dilatation of the prostatic utricle, but whether the result of tubercular breaking down or not was doubtful. On section the ejaculatory ducts on each side were found to be lined with yellow caseous material very similar to that seen in ureter. This condition had given rise to so few symptoms during life that its existence had not been suspected until the very last. The lungs were congested, and at the apex of the left there was a stellate cicatrix, firm, fibrous, and

deeply pigmented. On section a soft cheesy mass was found embedded in the pigmented cicatrix. Other organs comparatively healthy. It was pointed out as an interesting fact that never during the life of the patient was there any sign of pulmonary disease.

5. *Dr Woodhead* placed before the Society the KIDNEY from a case of Professor Simpson's, a woman, æt. 40, who came into the Infirmary to be operated on for cystic tumour, but who died during an attack of acute bronchitis. The right kidney appears to be replaced by an immense tumour, extending down into the pelvis. It is adherent internally, and on its anterior surface, to the ascending colon. The upper part of this mass is composed of about a third of the kidney. At the lower extremity is an enormous cyst, whilst between there is a large firm tumour mass, which appears to involve the lower two-thirds of the kidney. Length of whole tumour, 14 inches; breadth at widest part of solid tumour, $5\frac{1}{2}$ inches; of cyst, 6 inches; depth of cyst from above downwards, $8\frac{1}{2}$ inches; of solid tumour, $2\frac{1}{2}$ inches; thickness of solid tumour from before backwards, 5 inches; longest portion of normal kidney, 3 inches; greatest width, $2\frac{3}{4}$ inches; thickness, $\frac{3}{4}$ inch. In the centre of the solid portion was a large cavity, formed by softening and breaking down, and into this hæmorrhage had taken place. In the walls of the cyst were numerous projecting nodules, or small tumours, firm, pale or slightly pink, with but few hæmorrhages. In the large tumour there were, in addition to large softened area above mentioned, numerous points of yellow softening and hæmorrhage. At the periphery of the solid mass the substance was pale and firm; there were few hæmorrhages. The portion of kidney that is left was pale, but apparently quite healthy. Scattered over the whole peritoneal lining of the abdominal cavity were numerous cancerous masses (for such they appeared to be when examined under the microscope). Similar nodules were also found in the capsule of the liver, in the covering of the left ovary, but not in the ovary itself, in the broad ligament, and in the mesentery and meso-colon, especially close to the intestine, etc. The omentum was so greatly infiltrated that it formed a solid mass, slightly retracted, but more than an inch thick. The whole of the abdominal organs on the right side were firmly matted together. In the right psoas muscle was a large infiltrating cancerous mass. Diaphragm had small cancerous nodules on both peritoneal and pleural surfaces, and there were growths on the pleuræ and in the substance of both lungs. From appearances presented, it would appear that this was a case of primary cancer of the kidney, perhaps developing in connexion with the large cyst, and then spreading very rapidly to the positions mentioned. This seemed more probable than that

it started in connexion with the ovary, which was quite uninvolved on both sides, the peritoneum only being affected.

6. *Dr Mackenzie Johnston* showed a FIBRINOUS CAST from a case of fibrinous bronchitis.

7. *Mr A. G. Miller* exhibited—(*a.*) A FOOT which he had amputated for senile gangrege. There was gangrene of three toes, which had not increased or caused any irritation during five months since the formation of the gangrene. There was no line of demarcation. The foot had been kept wrapped up in sublimated wool sprinkled with iodoform during the five months. The dressing had been changed once a fortnight under the protection of the spray. Mr Miller remarked that this case, and others that he had heard of, seemed to prove that the area of ulceration between the dead and living textures, called the "line of demarcation," depended, to a considerable extent at any rate, upon the irritation of the living produced by septic changes in the dead parts.

Mr Cathcart said that in a case of traumatic gangrene of the toes treated by Professor Chiene a line of demarcation had formed. He believed that the parts had also remained aseptic.

Mr Hare, however, stated that although from a clinical point of view the case had seemed aseptic, a microscopical examination of the discharge had demonstrated the presence of bacilli.

8. *Mr Miller* showed (*b.*) A VERY LARGE CYSTIC TUMOUR removed from the outer side of the knee of a female patient. (*c.*) The CHART of a patient who had suffered from rupture of the urethra, illustrating the relation of temperature to drainage of the bladder when septic.

9. *Dr James Carmichael* exhibited the LUNG of a child who had died suddenly in the Royal Hospital for Sick Children from hæmorrhage. Immediate death from pulmonary hæmorrhage was sufficiently uncommon in the adult, and still more rare in the child. The patient, a boy aged 5, had been in hospital little over three weeks. Five weeks before he came under treatment pulmonary symptoms had shown themselves. The child, however, had been in somewhat indifferent health ever since he had an attack of measles five months ago. On admission his case did not present any serious or well-marked symptoms other than those of bronchitis. Soon, however, signs of consolidation appeared in the left lung, the physical signs being most marked at the apex posteriorly. Subsequently signs of smaller patches of consolidation in the central portion of the lung and towards the base became apparent. A week before the child's death the breath became fœtid. There was no expectoration to aid in diagnosis, which is so often an element of difficulty in judging of such

cases in children as compared with adults. The odour was more like that of fœtid bronchitis than gangrene of the lung; but owing to the general features of the case, Dr C. had expressed an opinion to the clinical class that there was probably a gangrenous cavity in the lung. On looking at the organ in section three cavities are observed, one at the apex being of considerable size, and containing gangrenous sloughy tissue. Another cavity, ragged and tubercular looking, was also seen in the apex. In the lower lobe, immediately under the septum, was a smaller cavity full of bright arterial blood, into which has opened by ulceration a large branch of the pulmonary artery, the site of the fatal hæmorrhage. The lung tissue, especially in the upper lobe, was of a grayish colour, firm consistence, with some collapsed bits, and evidently in a condition of interstitial pneumonia. There were some tubercular nodules on the pleura. The spleen likewise showed tubercles. The mesenteric glands were enlarged, and some of them caseous. The kidneys also showed commencing tubercular infection. Gangrene of the lung in children was not uncommon, but probably less frequently the result of chronic pneumonia than in the adult, oftener resulting from septic infection through the aspiration of putrid material in diphtheria, or noma, or in fœtid bronchitis, complicating pharyngeal or tonsillar necrosis after scarlatina. The fatal termination of the case by hæmorrhage was sufficiently interesting to deserve record.

III. Original Communication.

A CASE OF STRYCHNIA POISONING, WITH AN ANALYSIS OF STEINER'S VERMIN-KILLER.

By J. Allan Gray, M.A., M.D., F.R.C.P. Ed., Medical Officer of Health, Leith.

On the morning of the 10th November 1882, I was hastily summoned to 46 Coburg Street, Leith, to see a woman who was said to have taken poison. I reached the house at 9.22 A.M., and was met there by Mr Cousland, M.B., the Assistant House-Surgeon of Leith Hospital, who, on being called to the case about 9 o'clock, and recognising its urgency, had sent for me to see it with him.

The patient, a woman of 35 years of age or thereabouts, of middle height, and of well-nourished condition of body, was found lying in bed in the dorsal posture. She was perfectly conscious and rational, but somewhat flushed in face and excited in manner. The pulse was small and thready, 100 per minute; the respiration hurried; the pupils equal and dilated. There were no signs of vomiting or purging, nor any history that either had occurred.

On being asked as to what had caused this condition, the patient

informed me, as she had already told Dr Cousland, that at 6 o'clock in the morning (about three hours and a quarter previously) she had swallowed, with suicidal intent, the contents of a packet of vermin-killer; and she pointed to the cover and advertisement-sheet of a threepenny packet of Steiner's vermin-killer, which were lying on the table at the head of her bed, as being the wrappings of the powder which she had taken. Just as this information was obtained the patient called out suddenly, grasped in affright at the bedclothes and at our hands, asked to be held, and beseeched us not to leave her. Coincident with this there was a little twitching of the muscles of the face and neck, and a little increase of the lividity of the already congested face.

In the absence of a knowledge of the active ingredient of Steiner's vermin-killer, we had to be guided by symptoms. These pointed unmistakably to poisoning by strychnia, although the excited condition of the patient, the dilated state of the pupils, and the information derived from the neighbours that the woman had been drinking heavily of late, by raising a doubt as to hysteria or alcoholism, tended to obscure the diagnosis. Feeling certain, however, that the presence of strychnia explained the appearances—a view which was supported by the statement of the patient that the powder was of a bitter taste—I gave her at once $\frac{1}{4}$ grain of bimeconate of morphia hypodermically, and sent off for a quantity of chloral hydrate.

To empty the stomach was, of course, the next expedient thing to do, pending the arrival of the chloral, although, in view of the time which had elapsed since the poison was taken, this measure was not likely to be of such vital service as it would have been if employed earlier. Yet, on the other hand, the delay in the appearance of symptoms, as indicating delay in the absorption of the poison, rendered the emptying of the stomach likely to be of much more use than it would have been in a case where the invasion was more rapid. By this time, however, the jaws had begun to become fixed,—a condition which, as trismus is one of the later developed symptoms of strychnia poisoning, indicated that if the evidences of poisoning had begun late, they were now progressing at a considerable speed. The gag for the stomach-pump being therefore not easy of introduction, we determined to administer an emetic, and as Dr Cousland just before my coming had dissolved a drachm of sulphate of zinc in water, and had begun to give it, we now proceeded to administer the remainder of this with the spoon. When this had been done, the spasm had completely relaxed, and we were therefore able to introduce the gag and empty out the stomach. The contents and washings of the stomach were received by us into a clean basin, and retained for further examination. They consisted of a clear fluid, containing nothing more solid than a little mucus. Shortly after we had finished using the pump a severe spasm came on, attacking espe-

cially the muscles of the chest, but unaccompanied by opisthotonos or emprosthotonos. The patient became unconscious, the face grew more and more bloated, the pulse smaller and smaller; and although by this time the chloral had arrived, the need for it had passed, as the patient died from asphyxia at 9.35 A.M., thirteen minutes after I first saw her, and presumably three hours and a half after taking the poison.

The post-mortem examination was made at 10 A.M. on the 14th November, ninety-six hours after death. The face was placid, and seemed to have changed little since the patient was alive; it lacked altogether a death-like aspect. The whole body was in a condition of marked cadaveric rigidity, with the exception of the arms, the stiffness of which had evidently been overcome by force. The rigidity of the hands and fingers appeared especially noteworthy, though no marked incurvation of these or of the feet was to be seen. The back was considerably arched, but not to such an extent as to raise the buttocks off the table. There was a total absence of cadaveric odour, and the post-mortem lividity was by no means great. On opening the chest the heart was found empty on both sides, the right side flaccid, the left contracted; the blood was fluid and dark. The lungs were œdematous, and congested posteriorly, but were otherwise normal, with the exception of a few small emphysematous bullæ on their anterior aspect. There was no special darkening of the muscles of the throat and gullet, such as Casper found in the post-mortem examination of his first case of strychnia poisoning. The stomach contained 4 ounces of clear fluid of a bluish tint, resembling that removed with the stomach-pump, but of a slightly paler hue. The liver was congested and smelt of alcohol. The kidneys and spleen were likewise congested. There were numerous small cysts in the ovaries, but none presenting the appearance of a corpus luteum. The uterus was retroflected, but not gravid.

Analysis.—The contents of the stomach removed at the post-mortem examination, and the mixture of contents and washings removed during life, were separately subjected to dialysis and to Stas's process for the separation of alkaloids. Dialysis of 1 ounce of the fluid from each gave negative results in both cases, and Stas's process applied to the remaining 3 ounces of the contents of the stomach, which had been removed at the post-mortem examination, likewise failed to do more than just indicate the presence of strychnia. But Stas's applied to one-fourth of the mixed washings and contents demonstrated clearly the existence of strychnia therein, but showed that the alkaloid was not present in quantity nor adulterated with brucia. Analysis of the solid organs was unfortunately rendered impossible by the jar containing them having been accidentally emptied into one containing portions of similar organs from other cases.

Remarks.—What first strikes one in connexion with cases of

this kind is the great facility with which the woman was able to procure the poison. Her first intention had been to commit suicide with oxalic acid, and on the evening previous to her death she had gone to a druggist and asked for this substance; but, owing either to her then half intoxicated condition, or to her being unable to give any satisfactory reason for her intended purchase, the shopman refused her request. Later in the evening she called at the shop of another druggist, and on asking for rat poison was supplied with a threepenny packet of Steiner's vermin-killer, with what result the foregoing paper tells.

The next point of importance is the length of time which intervened between the taking of the poison and the appearance of active symptoms. The woman's statement that she took the powder at 6 o'clock seems perfectly trustworthy, and her neighbours who called on her at 8 o'clock certainly saw nothing very definitely the matter with her then, though they sent off to the hospital for the doctor on the strength of her declaration that she had taken poison. It was only towards 9 o'clock, just before Dr Cousland arrived, that the symptoms appear to have begun, though having once commenced they advanced with great rapidity. Making ample allowance, therefore, for indefiniteness regarding the exact time, we must conclude that at least two hours and a half had elapsed between the taking of the poison and the first appearance of symptoms. This delay is certainly considerable in view of the quantity of strychnia in the powder, and the form in which it was taken; for the package of vermin-killer which the deceased took contained, according to the subjoined analysis, about a grain of strychnia, mixed with a few grains of starch, and some harmless colouring matter. How much the previous drinking habits of the patient had to do with this delay, by deranging digestion and retarding absorption, it is impossible to estimate. In cases of compound poisoning with strychnia and morphia, or solutions of morphia, it is, of course, very different, since the two poisons are antagonistic in several respects. The delay is there often much longer than two hours and a half. In one case, recorded in the *Lancet* for 1882 (vol. ii. p. 724) by Mr Macredy, M.B., where the taking of a packet of Battle's vermin-killer with suicidal intent was immediately followed by the drinking of two ounces of laudanum, symptoms of strychnia poisoning did not appear until eight hours after, although the appearances of an overdose of opium, with the exception that the pupils were not contracted, were present when the patient was first seen by Mr Macredy four hours after taking the poison. It is, however, rare to have such a long delay as occurred in the present case when strychnia is taken in solution, and not accompanied by morphia or any drug of antagonistic action.

The diagnosis at the time I saw the case was not very difficult, for the history was given succinctly, and although the onset of the

symptoms was apparently delayed, the presence of the slight convulsive tremblings, which were altogether unlike those of hysteria, in being of tetanic character rather than alternate tonic and clonic, placed the diagnosis on a firm footing, in spite of the fact that the pupils remained dilated in the intervals between the convulsions.

As to the treatment adopted, the subcutaneous injection of morphia was certainly in the right direction, but possibly should have been exhibited in fuller dose. Had I known that so little strychnia remained in the stomach as the analysis of the materials removed by the pump showed, I think I should have left alone the emptying of that viscus, and have confined my attention to the subcutaneous administration of antidotes, such as morphia and chloral, and to the exhibition of chloroform by inhalation. In the circumstances, however, as I have already pointed out, I believe myself to have been entitled to act as I did, especially as the only harm which could accrue from washing out the stomach was that which might arise from the œsophageal tube provoking a convulsion. In the present case the clearance of the stomach was completed, and the tube removed before the appearance of the final spasm, with the causation of which the use of the tube could not therefore be associated.

The time at which death occurred and the post-mortem appearances were in accordance with those observed in similar cases of poisoning where death took place before extreme exhaustion set in.

Subjoined is an account of several vermin-killers, containing nux vomica or strychnia, which are in use in this country, and appended to the remarks on Steiner's vermin-killer is an analysis of that compound, which I made in the medical jurisprudence laboratory of the University.

Vermin Killers.—All of these are made on a large scale for commercial purposes. Their component parts are therefore but imperfectly mixed, and the amount of material allotted to each packet is but a rough approximation to the exact quantity intended. The percentage of active ingredient is consequently liable to much variation, and hence the great diversity in the chemical analysis.

1. *Battle's Vermin-Killer* is probably as well known and as variable as any. Tardieu's analysis makes it contain—

Strychnia, ...	0·10
Potato starch, . . .	1·00
Prussian blue, . . .	0·20
	1·30 gramme.

That is, each packet weighs 19 grains, and contains about 1½ grain of strychnia, or about 7·7 per cent. (Wynter Blyth's *Practical*

Chemistry, p. 317). Dr Letheby, on the other hand, found in it 23 per cent. of strychnia, mixed with flour, sugar, and Prussian blue (Guy and Ferrier, *Forensic Medicine*, 5th edit., p. 561). Dr Taylor (*Medical Jurisprudence*, 2nd edit., vol. i. p. 409) found a threepenny packet of this to contain 13 grains of flour, coloured with Prussian blue, and mixed with ¾ grain of strychnia—a quantity equal to 5·77 per cent. Another threepenny packet bought by him in London weighed also 13 grains, but a sixpenny packet only 23 grains. Professor Bernays (Browne and Stewart's *Trials for Murder by Poisoning*, p. 274) found this vermin-killer to consist of wheat flour, Prussian blue, and crystallized strychnia. The threepenny packet weighed 15 grains, the sixpenny 30 grains; the amount of strychnia in the former was 1·6 grains, equal to 10·69 per cent., and in the latter a quantity equal to 10·06 per cent.

2. *Butler's Vermin-Killer* consists of 5 per cent. strychnia, mixed with flour, and coloured with soot (Guy and Ferrier, *Forensic Med.*, 5th edit., p. 561), or sometimes with Prussian blue (Taylor). Taylor (*Medical Jurisprudence*, 2nd edit., vol. i. p. 409) found the sixpenny packet weigh about a drachm, and contain 2 to 3 grains of strychnia. The threepenny packet contained about half as much. Prof. Bernays (Browne and Stewart's *Trials for Murder by Poisoning*, p. 274) found that a threepenny and a sixpenny packet weighed together 56 grains. One of these contained flour, soot, and carbonate of barium, but no strychnia; the other flour, soot, and strychnia, but no carbonate of barium.

3. *Gibson's Vermin-Killer* contains about ½ grain of strychnia in each powder (Murrell's *What to do in Cases of Poisoning*, 4th edit., p. 122).

4. *Marsden's Vermin and Insect Killer* contains in each packet ¾ grain of strychnia (*Lancet*, 19th April 1856).

5. *Miller's Rat-Powder* consists of 1 oz. of nux vomica and 1 lb. of oatmeal, *i.e.*, about 5·8 per cent. of nux vomica. Since the average amount of strychnia in nux vomica is ·4 per cent., and of brucia 1·2 per cent., the probability is that this powder contains about ·023 per cent. strychnia and ·067 per cent. brucia (Wynter Blyth's *Practical Chemistry*, p. 317).

6. *Barber's Magic Vermin-Killer Powders* weigh 28 grains, and contain 10 per cent. of strychnia. *Hunter's Infallible* also contains it (Browne and Stewart's *Trials for Murder by Poisoning*, p. 284).

7. *Steiner's Vermin-Killer*, of which I had not heard until the present case, and to which I can find no reference in literature, is sold in packets at 2d., 3d., 6d., and 1s. In specimens bought at random, I found a twopenny packet weigh 6·48 grains, and a sixpenny packet 23·19 grains. Of the shilling packet I was unable to obtain a sample, but three threepenny packages weighed 9·14 grains, 9·51 grains, and 10·33 grains, giving an average of 9·66 grains.

Analysis.—It is a light azure blue powder, which adheres to the fingers when touched. Is without smell, but has a somewhat bitter taste. Microscopically, the low power shows it to be composed of white granules, among which are strewn a few white crystals, and a few smaller deep, dark blue crystalline particles. With 250× the granules, as pointed out to me by Professor Maclagan, have the appearance of arrowroot starch; and that they were starch was shown by their behaviour with diluted tincture of iodine. When a weak solution of iodine stood in contact with the powder for a few minutes, a strikingly characteristic reaction was obtained, the starch assumed a violet blue colour, the white crystals became tinged of a light yellow, exactly like the tinging given to crystals of strychnia similarly treated, while the dark blue crystals, unaffected in any way, stood out definitely from the rest of the field. From this it was accordingly evident that the powder consisted of three ingredients, one of which was a particular kind of starch.

A grain of the powder was now shaken up with an ounce of distilled water and allowed to settle for twenty-four hours, when it gave to the water a very faint blue tinge, and a distinctly bitter taste like that of strychnia, though very little of the powder appeared to have become dissolved in the water. The solution thus obtained was strictly neutral. Half of it evaporated down, and tested in the usual way with sulphuric acid and bichromate of potash, gave the play of colours characteristic of strychnia. The other half, when similarly evaporated down and treated with nitric acid, gave no reaction for brucia. The white crystals were therefore those of strychnia.

It remained now only to determine the composition of the third ingredient of the powder, the blue colour of which was suggestive of Prussian blue or ultramarine. Another grain of vermin-killer was accordingly shaken up with an ounce of distilled water, and to this were added a few drops of diluted sulphuric acid. The blue colour of the powder slowly disappeared, and sulphuretted hydrogen was given off, as evidenced by the smell and by the browning of a piece of bibulous paper, which had been moistened with acetate of lead. The reaction of a metallic sulphide thus given indicated the presence of artificial ultramarine, which is a complex substance containing a double silicate of alumina and soda in combination with a metallic sulphide, and which is frequently enough used commercially as a cheap colouring material.

In confirmation of the foregoing results, a few grains of the vermin-killer were now incinerated on a platinum knife. A strong smell of burning carbonaceous matter was evolved, and there was left a residue of a deep blue colour, like that of the colouring matter of the original powder as seen microscopically. Under 250 × this residue was found to be simply the blue crystalline

particles of artificial ultramarine already referred to, and treatment of this with a diluted mineral acid gave the reaction just mentioned. Qualitative analysis thus proved the vermin-killer to be composed of strychnia diluted with arrowroot starch, and coloured with artificial ultramarine.

To estimate the relative amount of the ingredients was the next step. I took, accordingly, a threepenny powder, transferred it to a platinum capsule, and found it weigh at the ordinary temperature 9·14 grains; warmed the capsule in a hot chamber, and found the loss from moisture ·47 grains. This result was quite in accordance with that obtained from warming two other specimens of the powder, one of which, weighing 10·33 grains, lost ·52 grains of weight, and the other, weighing 12·18 grains, lost ·63 grains of weight,—results which, if reckoned for 9·14 grains of the powder, would give loss by warming ·461 grains and ·472 grains respectively.

The 8·67 grains remaining were then placed in an ounce of distilled water, to which 2 minims of strong sulphuric acid had been added. The blue colour disappeared quickly, sulphuretted hydrogen was evolved, and a white deposit was left at the bottom of the fluid. This deposit was filtered, washed carefully, dried, and found to weigh 7·57 grains. Microscopically the deposit consisted of grains of starch in a somewhat swollen condition, mixed with a very small amount of amorphous and semicrystalline material; and chemically it gave all the reactions of starch, being insoluble in cold, but soluble in warm water, and coloured blue by iodine. The semicrystalline *débris* consisted of dust, which is found in all preparations not chemically pure, and of the deposit obtained from the action of the sulphuric acid on the ultramarine of the powder.

To ascertain the relative weights of the starch and of the *débris*, I proceeded to determine the quantity of colouring matter present in the vermin-killer. In order to do that I carefully incinerated a twopenny powder (weighing 6·48 grains), and found that 0·15 grains remained; and then a threepenny powder (weighing 9·51 grains), and found that 0·20 grains remained. This, calculated for 9·14 grains of vermin-killer, would give a residue of 0·19 grains of colouring matter, which amount, when weighed out and acted on by sulphuric acid, gave 0·04 grains of a white deposit. The starch in this sample should therefore be reckoned 7·53 grains, and the *débris* 0·04 grains, part of which is deposit from the colouring matter.

Returning now to the acid solution which had passed through the filter, I added ether, and then sufficient ammonium hydrate to render the mixture alkaline. After brisk agitation I drew off the ethereal fluid, and repeated the addition and withdrawal of the ether, until a quantity drawn off gave no reaction for strychnia with sulphuric acid and bichromate of potash. The ethereal

washings were then evaporated down, and the material which had been dissolved out thereby was found to weigh ·91 grains. This residue was crystalline in appearance, and gave all the reactions for strychnia, but none of those for brucia.

If, now, we compute the relative constituents of the three-penny powder weighing 9·14 grains from the foregoing analysis, we find

Moisture,	0·47
Arrowroot starch,	7·53
Strychnia,	0·91
Artificial ultramarine,	0·19
	9·10

So that Steiner's vermin-killer contains approximately 10 per cent. of strychnia.

Dr Philip remarked the absence from the paper of any reference to the physiological tests for strychnia, and wished to know whether Dr Gray was prepared to place implicit confidence in the sulphuric acid and bichromate of potash test. Should the more purely chemical not be supplemented by the physiological tests? A curious case illustrative of this point had occurred some years ago in Verona, in which a verdict of acquittal of the charge of murder was returned, in otherwise strongly suspicious circumstances, on account of the difference of opinion expressed by two eminent specialists as to the nature of the poison employed. Professor Ciotto of Padua, resting on the chemical reactions, maintained that he had obtained strychnia from the remains submitted to him. On the other hand, Professor Selmi of Bologna, while admitting that the colour reaction given by the similarly extracted substance with sulphuric acid and bichromate of potash was striking, concluded against strychnia, on the ground of the negative results afforded by the physiological tests. It might be that the body obtained was one of the series of cadaveric alkaloids, Selmi having described a ptomaine with the strychnia colour reactions. Further, Lombroso and Erba had obtained an alkaloid from decomposing maize with tetanizing properties, whose behaviour in the presence of sulphuric acid and bichromate of potash closely resembled that of strychnia. While, of course, there was little likelihood of error in Dr Gray's case, these points at least suggested the important lesson that no analysis in alleged cases of strychnia poisoning could be regarded as complete unless coincident evidence was obtained from both the physiological and the chemical side.

Meeting VIII.—April 7, 1886.

Dr Batty Tuke, *Vice-President, in the Chair.*

I. Election of Members.

J. Hogarth Pringle, M.B., C.M., Edin.; N. T. Brewis, M.B., C.M. Edin.; J. Batty Tuke, jr., M.B., Murrayfield, were elected Ordinary Members of the Society.

II. Exhibition of Patient.

Mr A. G. Miller showed a case demonstrating recovery from white swelling of the knee-joint of a severe type. The patient, a boy, had been under his care twice for this affection, and on each occasion had recovered. The treatment at first was the application of Scott's dressing and elastic pressure. On the last occasion on which he returned the joint was so far gone and the ligaments affected to such an extent that amputation was recommended, but declined. In its place the actual cautery was applied. When the slough came away excessive hæmorrhage occurred, and continued for about a fortnight. It turned out that the boy was a bleeder, and it was therefore fortunate that amputation had not been performed. The recovery of the joint was as perfect as anything he had ever seen, all the movements being quite restored.

III. Exhibition of Pathological Specimens.

1. *Mr A. G. Miller* showed two knee-joints from cases of amputation done for white swelling.

2. *Dr M'Bride* showed adenoid growths removed from the naso-pharynx of a young lady aged 15, who suffered from the ordinary symptoms of obstructed nasal respiration and difficulty in deglutition, all of which were relieved by the operation.

3. *Dr Littlejohn* showed a preparation exhibiting the effects of fire on the skin in a case in which death was brought about by burning. It illustrated the "cleft," which occurred so often in those cases, and which was liable to be mistaken for wounding from some sharp instrument. A simple inspection of the wound showed that it was really due to the skin giving way when scorched.

4. *Dr Allan Jamieson* showed a warty growth from the front of the proximal phalanx of the left forefinger, sent home from the Punjaub by Dr Hutchinson. The origin of it was the pricking of the skin by a species of grass, which caused a similar growth on the foot,

5. *Dr James Carmichael* exhibited a RACHITIC SPLEEN, weighing 2½ ounces, measuring 3½ inches in the long diameter, 2 inches transversely. The child, a little boy 19 months old, was admitted into the Royal Hospital for Sick Children about five months ago, and died last week. He was brought to hospital on account of vomiting and diarrhœa. On examination it was found that he was rachitic, and the spleen was considerably enlarged, measuring over 6¾ inches vertically. It could readily be felt by palpation, extending forwards close to the vertical line of the umbilicus, and downwards as far as the iliac crest. The condition of the spleen was diagnosed as one of simple hypertrophy. Chronic enlargements of the spleen were not uncommon in children, and one of the most frequent causes was a simple hyperplasia. This was generally met with in rachitic or syphilitic children. The reason he had brought this spleen to exhibit to the Society was to demonstrate the frequency with which alterations in size of the organ take place in these circumstances. The spleen sometimes enlarges very quickly, and often diminishes in size with equal rapidity. Two months after this child had been in hospital the vertical splenic dulness measured only 4 inches. A month before he died it measured only about 3 inches. The present measurement was, as already stated, about the same. The probable weight of the organ on admission would be about 6 ounces, the average normal weight of the spleen at this age being ½ an ounce. The organ was somewhat hard, the capsule thickened ; there was no waxy reaction with iodine.

6. *Dr Cotterill* showed two specimens of EPITHELIOMA of the RECTUM. The first of these was removed for recurrence two and a half years after operation. In all at least 7 inches of rectum must have been removed from this patient by the two operations. The second case had not been operated on previously. Both patients had made good recoveries. He thought the operation should be done more frequently than it was. By keeping the sphincter attached to the skin, stitching to it the stump of rectum, and draining the cavities made in the ischio-rectal fossæ, an exceedingly good result was got.

IV. Exhibition of Instruments.

Dr Foulis showed (*a*) a continuous SYRINGE for washing out the ears ; (*b*) A FORCE PUMP attached to his aseptic catheter to obviate the necessity for a siphon action.

V. Original Communications.

1. CASE OF INTRA-TRACHEAL TUMOUR.

By R. Mackenzie Johnston, M.D., F.R.C.S. Ed., and Joseph M. Cotterill, M.B., F.R.C.S. Ed.

Last summer, while I was in temporary charge of the Ear and Throat Department of the Royal Infirmary during the absence of Dr M'Bride, a patient came to me from the country for advice, suffering from what I found to be an intra-tracheal growth. As the case is one of some interest and considerable rarity, I think it right to place it on record. The following are the notes I made of the case, and which I publish with Dr M'Bride's permission:—

M. R., aged 13, a school-girl, came to the Ear and Throat Department on 14th September 1885, complaining of occasional suffocative attacks and considerable difficulty in breathing, more especially at night. She stated that she had not previously suffered from any serious illness, but, on the contrary, had been particularly healthy. Two years before she had a severe inflammation of the throat, but no details of any importance could be elicited about this, nor could she suggest any possible cause for her present condition. There was no rheumatic, phthisical, nor syphilitic taint in the family. Two sisters had died in infancy from childish diseases, but in every other respect her family history seemed to be unexceptionable.

Her mother gave the following account of the commencement and course of the present illness:—About twelve months ago she first began to notice that the child experienced some difficulty in breathing and occasional spasmodic choking attacks. The latter gradually wore off, but the breathing became worse, till she sometimes thought that the child would be suffocated at night. At this time also there appeared a certain amount of hoarseness or roughness of the voice; and this was, to a slight degree, perceptible when I first saw her. There was never any difficulty in swallowing, and she had neither cough nor pain. During the past months she had been under various forms of treatment. She had blisters applied to the throat, she had used several inhalations, and she had had medicines for bronchitis or asthma, but without deriving any benefit from their use.

On examination I found the patient to be a strong, healthy-looking girl, and well grown for her age. There was no tenderness nor swelling to be discovered in the neck. Her breathing was audible at some little distance, owing to a slight inspiratory stridor, but the dyspnœa was not distressing. She could phonate quite distinctly, but apparently only with some little effort.

On inspection with the laryngoscope I found the glottis widely open, and the epiglottis elevated, so as to give a full and excellent

view of the larynx and its cavity. The cords were normal, and quite free in all their movements. Looking beyond the cords, however, I saw a small roundish mass, about the size of a cherry-stone, situated in the trachea, apparently about 1 inch below the cricoid (in reality it was found to be more than $1\frac{1}{2}$ inch below). This tumour seemed to block up almost the whole lumen of the canal, and to be in contact with the posterior, anterior, and left surfaces of the trachea, the point of attachment being the former. On the right side the air-passage seemed reduced to a narrow slit, but doubtless the space was greater than appearances would lead one to suppose. There was no evident movement of the tumour even during forced respiration, from which I assumed that it must be sessile. In shape it was regular, smooth, and nearly spherical, and in colour it was rather paler than the surrounding mucous membrane. Its appearance varied a good deal at subsequent examinations, but probably this was due to the quantity of mucus covering it, or to the varying intensity of the reflected light employed to illuminate it. I passed a probe into the trachea with the view of ascertaining the consistence of the growth and its attachments and actual position; but this brought on such violent spasm, that I was obliged to desist from further attempts. An exact diagnosis was not possible, owing to the situation of the tumour and the difficulty of examining it thoroughly; but the case was evidently one of intra-tracheal neoplasm, either of a fibrous or polypoid nature.[1] I recommended early tracheotomy for the removal of the tumour, and advised the mother to allow the child to remain for that purpose. She was admitted to Dr Duncan's wards, then under the charge of Dr Cotterill, who arranged to operate on the following day. The removal of the growth was successfully performed by Dr Cotterill; but as he has kindly written a short account of the operation, I need not further refer to it here. On 6th October, about three weeks after the removal, I again examined the patient with the laryngoscope, and found the trachea quite clear; but on the posterior aspect there was a small grayish nodule, which might be either a slough or a recurring tumour.

9th October.—The disappearance of the nodule showed the former supposition to have been the correct one. The patient was free from all signs of obstructed breathing, and as the tracheal wound had quite healed, she was pronounced fit to return home. At the end of December (more than three months after the operation) I examined the patient, and found that she continued well and perfectly free from her former symptoms.

Remarks.—Stricture of the trachea may be the result of extrinsic or intrinsic causes Intrinsic stricture, or occlusion stenosis, may

[1] Since the above was put into type the tumour has been examined by Dr Bruce, who reports that its structure is that of a fasciculated sarcoma with an investment of epithelium, consisting of several layers of dentate cells.

be produced in various ways, and one of these, as illustrated in the foregoing case, is by the growth of neoplasms from the inner surface of the trachea. Although the larynx is a comparatively common situation for morbid growths, the trachea seems to be but seldom invaded by them. So rare, indeed, are intra-tracheal tumours, that Morell Mackenzie[1] states that, in his extensive throat practice, he has only met with four examples of this disease, while in sixteen years he has operated on 223 cases of laryngeal tumour.[2] Again, in von Ziemssen's exhaustive *Encyclopedia*[3] there is no special mention of growths in this situation, further than a passing allusion to them as an occasional cause of tracheal stenosis; and in other standard works I find no reference to them at all. Mackenzie explains the comparatively rarer occurrence of the latter growths by pointing out that the trachea is less liable to irritation, being a smooth passage, whose functions are merely passive, while the larynx presents numerous irregularities, and its component parts are in constant motion. To Solis Cohen, of Philadelphia, we are indebted for most of our information about such cases. He has, with great care, collected and tabulated[4] all the examples of this disease that have been recorded up to the present time—amounting, in all, to about 45 cases. The large proportion of these that were not discovered till after death makes it probable that many more may have escaped notice where the cause of death was not cleared up by a post-mortem, or because there is not the same desire to publish a case when the diagnosis has not been correctly made during life. Thus, of the 45 cases referred to—18 were diagnosed by laryngoscopy, 17 were diagnosed at the autopsy or during tracheotomy, and in 10 no information is given on this point. The records of many of these are so meagre, and the total number is so small, that it is almost impossible to generalize about them, but still we may note one or two points by a careful comparison of them. Adults, it would appear, are more often attacked than children, and men than women. Any portion of the trachea may be the seat of the disease; but the membranous part is the usual situation, and the relative frequency becomes less the further down the air-passage we go. As to the etiology of these growths we know nothing. After tracheotomy granulations, sometimes of considerable size, have been observed to appear on the cicatrix, and these, if large, may give rise to very similar symptoms; but they must not be confounded with the histologically true neoplasms at present referred to. They are called post-tracheotomic vegetations, and have been specially studied by Petel.[5] In none of Cohen's

[1] *Diseases of the Throat and Nose*, vol. i. p. 524.
[2] *Idem*, p. 299.
[3] *Encyclopedia of Med.*, v. Ziemssen, vol. iv. p. 479.
[4] Ashhurst's *Encyclopedia of Surgery*, vol. v. p. 743.
[5] *Des polypes de la Trachée*, Paris, 1879.

tabulated cases were the tumours connected with a former tracheotomy. Almost any form of non-malignant growth may occur in the trachea, but fibromata and papillomata seem to be the most frequent, 10 examples of the former and 8 of the latter having been recorded. Polypi, enchondromata, lipoma, cysts, etc., have also been observed. Besides the benign tumours referred to above, several examples of malignant growths have been recorded by Shrœtter, Rokitansky, and Klebs; but these, though of much interest clinically, have no bearing on the present case, as they are generally, though not always, secondary to disease elsewhere, and are not usually amenable to the same treatment.

The most important and chief symptom of this disease is dyspnœa—its intensity depending on the size and rapidity of growth of the neoplasm. Irritation of the trachea producing spasm may exist, and in my case this was noted at an early stage; but it passed off, possibly owing to the canal becoming accustomed to the growth. The prognosis is undoubtedly serious, fully 50 per cent. of the known cases having terminated fatally.

A diagnosis in this disease can only be made with certainty by means of a laryngo-tracheoscopic examination. This is often difficult or even impossible to perform; but, with practice, it may be often managed, for Mackenzie says he is now able to see the bifurcation in 40 per cent. of all cases examined. In M. R.'s case the examination was facilitated by the wideness of the glottic space, and the upright position of the epiglottis. In another case of obstructed breathing that I can recall, I noticed a similar condition of the parts. May this not be due to increased action of the abductors or to extra muscles being brought into play in the struggle to get air into the lungs? It would be interesting to know whether this corresponds with the experiences of others.

There can be little doubt that, with few exceptions, tracheotomy should form the first step in the treatment, both because it is the safest for the patient and the most thorough in its results. A few cases, however, have been treated by endo-laryngeal operation, but this is only possible when the tumour is situated high up. Labus succeeded twice in removing the growths by forceps, and Mackenzie[1] succeeded in two out of three cases in obtaining a cure with the electro-cautery. Shrœtter[2] got rid of one growth by the injection of ferric chloride, but in other hands the same plan in one case terminated in sudden death. In Cohen's table I find that tracheotomy was proposed to 10 patients, but was declined by 4, while in the remaining 6 the operations were successful, and resulted in cure, except in one case, where diphtheria supervened after four days, causing death. All the four cases not operated on eventually terminated fatally.

[1] *Op. cit.*, vol. i. p. 525.
[2] Cohen, *op. cit.*, p. 748.

Account of the Operation.

The extreme rarity of benign tumours affecting the trachea renders it advisable that any operation performed for their removal should be carefully noted; but I do not propose to detain you by a lengthy consideration of the operation performed in this case of tracheal tumour; but rather, in a short sketch of the case, to touch upon one or two points which appear to be of practical interest.

The patient, M. R., aged 13, came under my care upon the 14th of September last, while I had charge of Dr Duncan's wards in the Royal Infirmary. During the three days which she spent in the Infirmary previous to the operation I had several opportunities of examining the tumour, and agreed with Dr M. Johnston (who had sent her to me for operation) in considering the growth to be a fibroma: sessile; almost spherical in shape; blocking up almost the whole of the lumen of the trachea, leaving only a small crescentic chink in front and to the right through which the air passed, and attached, as far as I could judge, at least an inch and a half below the larynx, posteriorly and to the left side. The dyspnœa was very considerable at times, especially at night; and due precautions were taken in case of any suffocative fit supervening, which might render tracheotomy necessary.

And here a question presents itself. In a case of this sort, where for various reasons the removal of the tumour is not to be undertaken for a day or two, how far is one justified in delaying the performance of tracheotomy? Should I have performed it at once on her admission, and then proceeded to the removal of the tumour subsequently? I believe not, and for the following reasons:—

1. The tumour was sessile and motionless, and consequently no sudden change of its position could have intensified the dyspnœa. In the case of a movable pedunculated growth or loose foreign body in the trachea, the matter is entirely different, and no delay is admissible.

2. The worst fits of dyspnœa had always occurred at night during sleep; they were evidently due to the collection of mucus in the narrow chink between the growth and the tracheal wall. These fits of dyspnœa she had always easily dispelled on waking by coughing, and we were able to help her to this end by placing her in a suitably warmed and moistened atmosphere.

3. It is unwise to insert a tube unless you are prepared to go on with the operation of removal of the tumour at the same time, for reasons which will appear in the narrative of the case.

Upon 17th September the patient was put under the influence of chloroform, and I proceeded to expose the trachea by an incision beginning at the lower margin of the thyroid cartilage, and extending downwards some 4 inches towards the sternal notch.

The superficial parts being drawn aside, there came into view an enormously enlarged thyroid gland. It was of a firm and fleshy consistence, and absolutely devoid of any appearance of an isthmus, its shape resembling that of a very large chestnut. It closely covered the trachea from the cricoid cartilage for at least an inch and a half downwards.

At this stage of the proceedings the patient vomited, and some of the vomited matter lodging in the air-passages caused such alarming symptoms of suffocation (breathing stopping entirely, and the patient becoming rapidly and deeply cyanosed), that I was forced to open the trachea as quickly as possible wherever I could get at it. I accordingly cut through the cricoid and first ring of the trachea, and passing in a feather cleared the passage, and had it held open with blunt hooks till the patient recovered herself.

Here I would remark that in such circumstances to hastily put in a tracheotomy tube would have been worse than useless, as it would have injured the tumour, and by causing it to bleed, or breaking off a piece of it, might have made matters worse. I think it is an essential that in all such operations the tube should be put in *below* the tumour or not at all. (Of course I exclude such cases as where tracheotomy is done for spasm of the glottis due to a tumour situated low down and out of reach of the tracheotomy tube.)

Through the opening that I had now made into the trachea I was able to satisfy myself that the tumour, as we expected, was situated on the posterior wall and about an inch below my incision into the trachea.

I then set to work to clear the trachea below the enlarged thyroid gland; and this was a matter of great difficulty, owing to the distended veins and the very deep position of the trachea, as I had to open it very low down on account of the enlarged thyroid gland, and in order to avoid the tracheal growth. Having inserted a large well-fitting tube through the lower wound into the trachea, I then removed the fibroma through the upper opening with a pair of polypus forceps curved on the flat, keeping the patient's head well down over the end of the table in order to prevent any blood running into the lungs in case hæmorrhage from the growth should prove considerable. There was not, however, very much bleeding, and it soon stopped with the pressure of a small pad of lint.

It has been recommended in these cases that the stump of the growth should be thoroughly cauterized with nitrate of silver. I did not do this, however, but scraped with the finger-nail the stump of the growth until I was satisfied that it was thoroughly eradicated.

The tumour, which I show you, is a fibroma of firm consistence. It has shrunk considerably in the preserving fluid since its removal. It measures $\frac{7}{16}$ of an inch long, $\frac{6}{16}$ broad, and about $\frac{1}{3}$ of an inch deep.

The tube was removed upon the second day after the operation. I was anxious to get it out as soon as possible, as it was necessarily of large size, in order to reach the deep-seated wound in the trachea, and so fitted very tightly; and it lay in such close proximity to the aorta, as to be very visibly moved by every pulsation of that vessel.

After the operation the breathing was always quite easy, and upon the day after the removal of the tube she could phonate quite distinctly.

Ten days after the operation the wound in the neck had closed, and the day following she got up and walked about the ward. She left the Hospital on the 10th of October cured, having been previously examined in my absence in the country by Dr M'Bride and Dr Johnston, who reported that the throat was to all appearance normal.

I examined the patient a short time ago, and found that no trace whatever remained of the tumour; and though five months have elapsed since the operation, there is no appearance of any return of the growth. She breathes and phonates normally, and sleeps without any noise. Her general health seems to have improved considerably since the removal of the growth. She was exhibited at the last ordinary meeting of this Society.

It is, of course, impossible to generalize from one case, but the following inferences may perhaps be drawn from a consideration of this case taken in conjunction with the reports of other similar cases given by Störk, Gibb, Morell Mackenzie, Fifield, Türk, and others:—

1. That sooner or later these cases tend to destroy life by suffocation, unless some operation for their removal is resorted to.

2. That when the tumour is small and high up in the trachea, it may in some cases (as in one reported by Dr Morell Mackenzie) be cured by the application of the galvano-cautery, with the help of the laryngoscope; though in one of three cases reported by Dr Morell Mackenzie he reports that the vocal cords were injured by the cautery. Dr Mackenzie also states that three out of the four cases which he has seen were papillomata and not fibromata.

3. That when the tumour is low down in the trachea, large, and of firm consistence, or when the patient is not a good subject for laryngoscopy, the best proceeding is one similar to that which I have described.

4. That, unless the tumour is very high up in the trachea, the first step of the operation should be to open the trachea *above* the tumour. One can then judge exactly by sight or touch of its precise position and nature, and ensure the second and lower opening for the introduction of the tube being made accurately below the tumour. The tumour can then safely be removed through the upper opening, while the lower opening gives one an opportunity of plugging the trachea and preventing hæmorrhage into the lungs.

5. That when a tube can be inserted below the tumour, the growth is best removed by forceps or otherwise at once; but that when a tube cannot be put below, it may be safer to attack the growth through the tracheal wound with galvano-cautery. This method obviates the chance of bleeding which, though not excessive in my case, would certainly have been troublesome, if I had not had a tube in below the site of the tumour, and was so enabled to employ pressure by a plug of lint to the bleeding stump.

It also obviates the risk of injuring the vocal cords with the cautery, as happened in one of the recorded cases.

6. That the subsequent history of this case shows that the application of caustics to the stump of the tumour is probably uncalled for.

Dr M'Bride said the subject of tracheal tumours had been so well discussed in this paper that he could do little more than congratulate the authors. Dr Johnston had raised an important point in connexion with the wide opening of the glottic chink, which he thought he had observed in other cases of dyspnœa, and suggested that it might be due to increased action of the abductors. He (Dr M'Bride) must, however, say he had seen a number of cases in which there was dyspnœa, and not more opening than usual of the glottic chink. He should like to ask if a microscopic section had been made, because if not it would be very difficult to say whether the tumour was a papilloma, a fibroma, or polypoid.

Dr Duncan said that from Dr Cotterill's description one gathered that the upper opening into the trachea was made simply on account of the dyspnœa which prevailed at the time of the operation, in consequence of vomited matter having gone down the trachea. He was rather inclined to differ from Dr Cotterill as to the necessity for two openings in such cases. The upper opening in this instance was called for by the accidental conditions of the case. But why two openings should be made if one would do he did not see. If the position of the tumour could be diagnosed, why should not one opening below it suffice to remove the tumour and insert the tube?

Dr Foulis said that from time to time one saw tumours brought before the Society and spoiled, as this one was, by being kept in spirits. They were much better preserved in Müller's fluid, which did not destroy the histological characters, and if they were at any time required for exhibition, it was sufficient to soak them for a few hours in a mixture of one part of spirit to four of water. By this means the colour of the Müller's fluid was washed out, and the specimen, though well hardened, presented a natural appearance.

Dr Cotterill said section had not been made because it would have spoiled the tumour, and if a diagnosis could be made without, it was better to keep it whole. He had very little doubt that it was a fibroma, but a microscopical examination could still be

made. The tumour was preserved in Müller's fluid till about three weeks back, when it had become so black and had shrunk so much that it was put in spirits.

Dr Foulis.—May not the fluid have been chromic acid?

Dr Cotterill was not certain, but thought it possible, as it was put in in the pathological department of the Infirmary. As to the two openings, though the upper was made accidentally, he should feel inclined to do the same thing again, more particularly as it was difficult to diagnose exactly the position of the tumour.

Dr Craig said he had found a solution of chloral hydrate of the strength of five or ten grains to the ounce a very perfect preservative fluid. He had specimens preserved in it for about twelve years, which were still in a very perfect condition.

Dr Foulis said that chloral hydrate did not preserve the histological characters. Müller's fluid and chromic acid did.

Dr Batty Tuke said he recommended the use of chloral hydrate solution to the Marine Station at Granton, where it had been found to preserve animals in a condition fit for dissection better than any other fluid that had been tried.

Dr M'Bride said that some time ago he had preserved a fibrous tumour from the naso-pharynx in chloral hydrate solution. When a section was made it was found to be quite destitute of epithelium.

Dr Johnston said that evidently the paper did readily admit of much discussion owing to the great rarity of the case and the absence of controversial points. He was pleased that Dr M'Bride had noticed his suggestion as to the excessive abduction of the cords possibly being due to the obstruction of the respiration, and hoped, with the excellent opportunities at his disposal, that he (Dr M'Bride) would soon be in a position to support this view or to refute it. The remarks on the operative treatment of such cases had been replied to by Dr Cotterill, so it only remained for him to thank the Society for the kind reception accorded to the paper.

2. DIPHTHERIA.

By W. Watson Campbell, M.D., F.R.C.P. Ed., etc., Duns.

Notwithstanding all that has been said and written about diphtheria, and though it be conceded that most of those who have contributed to the literature of the disease have helped to advance our knowledge, much remains unknown and much is *sub-judice*. As, during the last twenty years, I have seen many cases, and have given much attention to this disease, I trust I shall be excused for venturing to offer a few propositions about it, even though I differ materially from others who have had abundant opportunities of studying it, and who are justly regarded as authorities.

My first proposition is—That diphtheria is primarily a local disease. The chief difficulties that come before me, in seeking to

establish this proposition, are—the apparent absence of exudation at the outset, and when the general constitutional disturbance is great; the comparatively slight local distress in many cases (so slight as to be disregarded by the patient himself); the appearance of the exudation *after* the constitutional disturbance has been established. With reference to these difficulties I remark that the absence of exudation may only be apparent. I think those who have had much experience of this disease will corroborate the statement that, sometimes, only a small amount of exudation can be seen even when there is great general distress; and, I believe, a sufficient amount to cause this distress may, for a time, escape observation. The exudation may have begun in a pharyngeal sulcus, and have caused the constitutional disturbance, whilst it did not appear until, by extent of growth, the sulcus was no longer able to conceal it. Again, while apparently the local manifestation of disease may be so slight as to be out of comparison with the great systemic disturbance, I have seen at least one case where the local suffering was so slight as to cause no complaint, but in which the exudation was really extensive, and quite in keeping with great constitutional disturbance.

When called on to attend a member of a family suffering from diphtheria, I make a point of examining all their throats, and continue to do so occasionally during my attendance. I have sometimes, in this way, discovered the exudation before the patients were aware that there was anything amiss—certainly before any constitutional disturbance was complained of. I have just referred to a case where there was a great amount of exudation, and where the general disturbance was proportionally great, but which was peculiar in this—that the patient did not complain of local distress; and as this case tends to prove that the latter condition may, for a time, be overlooked, I shall briefly narrate it, as it certainly impressed me much. I called on a lady four or five days after her first confinement, and found her very seriously ill, as indicated by a pulse of 120 and a temperature of nearly 105°. Her puerperal progress was satisfactory, but, while puzzled to account for high pulse and temperature, the nurse remarked that she had complained a little of her throat the previous night. The patient, who had said nothing about her throat before, now said that it "was a mere nothing;" but, on examining it, I found the left tonsil and pharynx, and part of the right tonsil, covered with a thick diphtheritic exudation. In this case there was certainly a little complaint of the throat before I saw the patient, but she had to be reminded of it, by the remark of the nurse, on the occasion of my visit next day. Here the local disease was overwhelmed by the constitutional disturbance, and I admit that I might, after prescribing for general symptoms, have departed in ignorance of the true state of matters, but for the casual remark of the nurse. Had I done so, and, next day, from extension and

complaint of local disease, discovered the exudation, it is possible that I might have considered it second in point of time. I think there must have been similar cases met with in the experience of other physicians.

Again, there is a tacit acquiescence in this proposition, if I am at liberty to base this statement on the general practice of the profession as regards treatment. I think that the rule is that, from the first appearance of the exudation, it continues to be as carefully watched as the general symptoms, and that it is subjected to special treatment—the increase of the exudation being dreaded, while the gradual disappearance of it is regarded as one of the most hopeful signs of recovery. Further, I think it will be admitted that the more quickly this exudation is got rid of there will be less risk of secondary local disease, such as glandular swelling, cervical cellulitis, and the more remote paralysis.

Second Proposition.—That there is not a so-called period of incubation: that, as soon as the local irritation begins, the constitutional symptoms follow, resembling in this respect the presence of a foreign body, or the irritative contagium of vaccinia.

Third Proposition.—That, supposing it due to infection, however arising, like scarlatina, typhoid, or small-pox, it differs from these in one very important particular: that, while one attack of any of these diseases seems to eliminate a mysterious specific pabulum, and so secures immunity from recurrence, or recurrence of much less intensity than the first attack, diphtheria, on the other hand, leaves the patient for a considerable time more susceptible of the disease. This fact I have frequently observed. Without asserting an explanation, I may be allowed to suggest one. There are, of course, two things to be borne in mind when considering infectious disease—susceptibility and the presence of or exposure to infective material. Now if, during the prevalence of an epidemic, all exposed to infection were equally susceptible, all would be likely to be affected; but we know that the degree of susceptibility varies in different individuals, and even in the same individual at different times. In this way only can we account for the fact that, having escaped at one time when exposed to infection, some may have the disease at another time when less exposed to it. I am therefore inclined to think that the liability to recurrence for an indefinite time after an attack of diphtheria is due, in the first place, to the parts being left in a more susceptible state, which is still further heightened by colds; and, in the second place, to the existence and accessibility of spores or germs. One swallow does not make a summer, but one case which I will mention is corroborative as far as it goes. Two or three years ago I attended a girl, about six years old, for diphtheria. After recovery she caught cold and had the disease again. This occurred frequently. The house in which she lived was a comparatively recent erection, and seemed all right, but the frequency of the recurrences led me to advise that the

sewers should be carefully examined. This was done, and they were found in a very unsatisfactory condition. Without delay all was put right, and though the child has had colds many times, she has had no more attacks of diphtheria.

Fourth Proposition.—That diphtheria is parasitic and fungoid in character. I admit that I have been led to this conclusion by close observation of its progress under treatment, and not by microscopic examination. I have never heard or read of an exudation appearing on a spot not accessible to air, which is essential to such growth; and, acting on this assumption, I have succeeded in curing the disease simply by excluding air. I have only seen two cases of diphtheritic conjunctivitis. These occurred about the same time, but in different families living about ten miles apart. In both families I had cases of diphtheria, with the so-called exudation in the throat. One was that of a girl about 11 years of age, the other that of a young man about 18. In both, the feelings of the patients and appearance of the eyes were alike. Both complained of heat and tenderness rather than pain, both conjunctivæ were injected a good deal, and the patches were nearly of the same size,—about the eighth of an inch in diameter —and rather thick, and of a dirty yellow colour. Believing the patches to be diphtheritic, and also that the disease was due to fungoid parasite, I treated both in the same way. I saturated a sufficient quantity of absorbent wadding in a solution of permanganate of potash, and put it over the closed eye of each patient; over this I put another quantity of dry wadding, and fastened all with a bandage which I did not remove for, I think, five days. On removing this dressing and bathing the eyes with tepid water, all seemed right, and continued so: neither gave me further trouble. In the *British Medical Journal* of 12th December last, Dr Lord reports a case of genuine diphtheria which he treated successfully by painting the exudation frequently with tolu varnish, as recommended by Dr M'Kenzie. In this instance the disease was treated as a *local disease*, and the success of the treatment seems to have been due to the *exclusion of air* by the varnish.[1]

If my first and fourth propositions be correct, they should have an important bearing on treatment. If the disease be at first local, attention should be mainly given to it, in the hope that early removal will prevent or check the development of constitutional disturbance. Again, if I am correct as to the nature of the disease, it is evident that it will require to be as closely watched during night as during day, for it will grow as much when the patient is asleep as when awake. Diphtheritic patients are sometimes unusually drowsy, and the physician is tempted to give way to the feelings of the patient, and, while treating the

[1] Taking this view, I think the recoveries after tracheotomy, for diphtheria, may be owing to the respiration being carried on below the seat of the disease.

general symptoms, assiduously avoid giving trouble by frequent examination of the exudation or growth. I have treated my patients for many years as if I were right on both these points, and the result has been thoroughly satisfactory.

In the *Edinburgh Medical Journal* (February 1867) I advocated the use of permanganate of potash as a gargle, and since that time have relied on it solely for local treatment. I am persuaded that, if properly used, nothing will be found superior to it. I am quite aware of the danger of severe criticism to which I expose myself in using such words, but I do so deliberately. I say—*if properly used;* everything depends on this. The strength of the solution I use is $\frac{1}{2}$ gr. to the ounce, and it must be used so as to reach and play over the entire pharynx. This can only be done by causing the patient to throw the head well back, and keep the mouth open to the fullest extent when gargling. At least two ounces of the solution must be used every time, and as much as four ounces, if it do not distress the patient. Then, again, I insist on its being repeated night and day every two hours. For this purpose the patient must be wakened up very often. Of course this is annoying, but it is absolutely necessary, for, if it be not done, and sleep be allowed for six or eight hours at a stretch, on examining the throat the exudation will, in a large number of cases, be found more extensive. I have never ceased to insist on the importance of this very frequent use of the local application since I found the advantage of it in my own case,[1] and I was much impressed also by the necessity of it in the following:—I was asked to visit a child about four years of age, said to be suffering from croup. On doing so, I found him dying from diphtheritic laryngitis. Next morning his mother complained of her throat, and, on examining it, I found large patches of exudation on both tonsils. She at once began with the gargle, and used it faithfully till night, when not more than a third of the exudation was to be seen. She was allowed to sleep all night, and in the morning the patches were as large as ever. Gargling was resumed, and at night she was again much better, and the exudation much less. Again she was allowed to sleep without being disturbed, and in the morning she was worse, and the exudation at least as extensive as when I first examined it. On learning that she had not used the gargle during night, I gave strict orders that it was to be persevered with night and day, and the result was that the exudation was gone within forty-eight hours, and the patient almost quite well.

In a great number of cases the patients are too young to gargle satisfactorily, yet a tractable child can soon be taught to do so. I had a patient, a short time since, under 4 years of age, who soon learned to gargle properly; but, where this cannot be done, I advise swabbing with a solution of double the strength. This process, to be successful, requires special care also. I remember persuading a

[1] *Journal*, February 1867.

professional friend to try it, and after doing so, he told me there was no benefit from it. I saw the patient with him, and was not surprised at his want of success. The solution was in an open tumbler—a bent hair-pencil was lying in it; this pencil was taken from the tumbler and applied to the throat, and then returned to the tumbler. Of course, the solution was soon rendered useless. For the purpose of swabbing properly, I use a wire about the eighth of an inch thick, slightly flattened at the end, and bent in a curve to suit, conveniently, the passage into the pharynx. After fixing a sufficient quantity of absorbent wadding, by twisting it round the flattened end of the wire, I press the swab, thus made, firmly on the palm of my hand to make sure that the end of the wire is sufficiently covered and padded; then, dipping it in the solution, I get the mouth well opened, and pass the swab right down the throat. This causes no pain, is not attended with risk, and, if done properly, the pharynx will close on the mop and compress it. After withdrawing it, I burn off the wadding, and make a clean new swab. This little operation should be repeated as frequently as the gargle.

I have often wished I knew of a way to use this remedy in cases where the disease elects or extends to the air-passages in very young children, but I know of none. I have, however, used it successfully in two cases—one patient a lad of 18 or 19, and the other a girl of 13—by atomizing the solution by means of a simple vaporateur. The former patient had been suffering from diphtheria in the pharynx for some time before I saw him. I was only called in after the disease had extended to the larynx and seriously affected respiration. I thought the spray might be of service in this case, and, having procured one of these simple toys—made of two glass tubes at right angles—I told the patient to open his mouth widely, and breathe as fully and freely as he could, while I blew the spray right into his mouth. His mother was not long in learning how to use it, and he made a steady and rapid recovery. The other patient is just convalescent. The symptoms in both cases were very severe and urgent; both were aphonic, and could only faintly whisper; rough, hard, grating cough and stridulous breathing caused both great distress. The double-celled india-rubber hand-spray would act much better, as there would be no break in the supply of spray, such as occurs when the operator, with the vaporateur, requires to take a deep inspiration. The strength of the spray solution used in both cases was 1 gr. to the ounce.

I may here mention that, for some years, I was in the habit of administering to my patients tinct. ferri perchlor. as an antiseptic, and also of giving wine, in varied quantity, every four hours. Whilst treating my patients thus, I sometimes had great trouble with general pharyngeal œdema, and I imagined that the contact of the medicine or the stimulant with the tender throat had something to do with this. I therefore stopped both, and, strange to

say, I have not had a serious case of the kind since. Under the treatment I recommend the disease is very quickly mastered, and meat-teas and milk are quite sufficient to sustain the patient. To check or remove constitutional disturbance, I rely on sulphocarbolate of soda, in 20 gr. doses every four hours for an adult, and 1 gr. for each year for children.

I would like much if this treatment had a fair and extensive trial. I am quite confident the result would be such as to encourage a continuance of it—even if it did not lead to the adoption of my views as to the nature of the disease.

Dr Foulis said that at first it had been his experience that almost every case of diphtheria in which the disease had passed into the air-passages had died. He confessed he did not know what to do in diphtheria except to support the patient as much as possible, and to keep him quiet, and especially not to disturb the diphtheritic patch with caustics. The plan he had adopted during the last few years was to saturate the patient with chlorate of potash as quickly as possible, and apply boroglyceride locally. He agreed with Dr Campbell that the patient should not be allowed to sleep for long at a time. He was entirely in accord with him in regard to permanganate of potash, but preferred boroglyceride because of its agreeable taste and antiseptic qualities. Since giving chlorate of potash in very large doses, frequently repeated, in such a way as to saturate the patient, he had not lost a case of diphtheria.

Dr James Carmichael was specially interested in the treatment of diphtheritic affections in children. With the general principles of the management of such cases as laid down by Dr Campbell, and also with the remarks of Dr Foulis as to local treatment, he cordially agreed. He did not consider chlorate of potash of much value in these cases. He gave it sometimes in small doses, but large doses he thought decidedly hurtful. In regard to local applications to the throat in young children, he thought we were often in a very helpless position, from the difficulty of their application when the child resisted. He had never been able to induce young children to gargle, and local applications with the brush often alarmed them to such an extent as to make them obstinately refuse food or medicine by the mouth. In practice there were two methods of application to the throat he found available besides brushing. The spray was a most useful means to attain the desired end, and if we used an instrument with a long nozzle, such as that suitable for the anterior nares, and passed it well back into the mouth, there was comparatively little difficulty in making the application. There were many solutions which he had found useful besides the permanganate. Boroglyceride was undoubtedly good, being pleasant and non-irritant. He had not found it succeed in all cases. Lime water, perchloride of iron, perchloride of mercury, and lately pancreatic extract and

resorcin, had been commended. The third method of locally applying remedies to the throat was by administering internal remedies, which, during deglutition, exerted a local influence on the affected part. The mixture he had found most useful for this purpose was one of perchloride of iron and perchloride of mercury, with glycerine and water. He considered it of great value. In his experience he had not found the true diphtheritic membrane disappear so quickly under treatment as had been indicated by Dr Watson Campbell. The croupous membranes, which were apt to be mistaken for diphtheritic ones, often did so in a few hours. In most cases of diphtheria the free administration of alcoholic stimulants was indicated. The recovery of the child very much depended on the extent of the local disease. If it extended far into the air-passages the prognosis was grave.

Dr Allan Jamieson said there was one point one would have liked to have heard a little about, the etiology of diphtheria. The disease was more common in the country than in the town, and occurred in places where there was nothing in the hygienic conditions to account for its appearance. It had been known to occur at considerable heights above the sea-level, and it had been observed in Australia that it had occurred at places at a considerable distance from each other, and in the direction of the winds. He was much interested in what Dr Foulis had said regarding boroglyceride. He believed he was the first to use it in diphtheria. There was one disadvantage in gargling. The inflamed parts were kept in a state of vibration, and not given the rest they required. He agreed in the condemnation of caustics, but suggested that chromic acid, which removed the mucous patch in syphilis without setting up irritation, might be used in diphtheria.

Dr Craig stated that he happened to be in Biggar during an epidemic of diphtheria. The late Dr Pairman and other practitioners were then trying sulphurous acid as a local application, not in the form of gargles, which he believed to be mistaken in principle, but as a lotion applied to the part by a camel hair pencil, and also as a spray, and they had most successful results. He was inclined to agree with Dr Watson Campbell that diphtheria was a local disease, more or less parasitic in its nature, and the fact that it was best combated by parasiticides favoured this view. He had almost invariably treated his cases with permanganate of potash, in which he had very great faith. He did not think that Dr Carmichael understood Dr Watson Campbell in regard to the disappearance of the membrane. Dr Watson Campbell gave forty-eight hours as the shortest period within which it had disappeared.

Dr Johnston noticed that great importance was attached in the paper to gargling the throat frequently with permanganate of potash. Now he thought that the gargling was the least efficient

method of applying antiseptics to the throat, and that it was much inferior to the spray or to direct applications. In addition to the irritation to the parts produced by the exertion of gargling, the fluid only came in contact with a limited portion of the throat. This had been proved experimentally by Scheck of Munich, who found that the only parts brought in contact with the fluid were the anterior surface of the soft palate and the tonsils, and hardly any of the pharynx.

Dr Craig said he was in the habit of teaching that to his class.

Dr James Ritchie deemed it of the utmost importance to recognise that diphtheria was at first a local disease, and that at a very early date it affected the system constitutionally. He thought Dr Watson Campbell's paper an excellent demonstration from his own practice of the truth of this theory. In this view careful attention to the local treatment was essential, the speaker adopted the plan of hourly germicide applications during the day, and every two hours over night. The kind of local application is determined partly by two considerations. First, post-diphtheritic paralysis most frequently affects those parts which are much used—the most common seat of paralysis was the soft palate—might not this frequency be determined by the excessive use of the part in gargling? He therefore preferred the spray and local applications by means of a brush. He generally used Condy's fluid, and found it of special use in those cases affecting the larynx, and in order to ensure the proper inhalation of the spray he found it necessary —at least in children—to hold the nostrils during the application. The other consideration related to a symptom which is very variable in this disease, viz., the amount of pain. For this he had found a useful application in a solution of boroglyceride, first introduced to the notice of this Society some years ago by Dr Allan Jamieson. While attaching most importance to local treatment, the constitutional should not be neglected, and he was in the custom of prescribing chlorate of potash and perchloride of iron in mixture for internal use. Rest and careful dieting he considered to be essential.

Dr P. A. Young said the caustic treatment had been very properly condemned, but it had been pointed out that in severe epidemics in France, as pointed out by Bretonneau, the best results had been got by the priests, who invariably used the caustic treatment. The last utterances regarding chlorate of potash declared it to be a broken reed. One remedy not mentioned had been very successful in his hands—continuous steaming. He was not inclined to consider pain in diphtheria an anxious symptom. It indicated that the membrane was coming away.

Dr Webster praised lactic acid, which he applied on a swab, using the full strength.

Dr Craig said the strength of the lactic acid was much increased in the new Pharmacopœia.

Dr Watson Campbell replied.

Meeting IX.—May 6, 1886.

Dr Batty Tuke, *Vice-President, in the Chair.*

I. Exhibition of Patient.

Mr Bryce showed for Dr Alex. Bruce a man suffering from chronic poisoning by bisulphide of carbon, and read the following synopsis of the case:—

Case of J. S., æt. 47, employed in the Rubber Works in Edinburgh. For two years the patient has been nearly constantly exposed to the fumes of the poison rising from the "curing troughs." After three months of exposure he became very languid and easily tired. He lost all appetite, frequently vomited, and had always more or less nausea. Then, after a month or two, he found himself drowsy in the evening after his work, but sleepless at night, constantly waking up with a start, and frequently dreaming that he was falling over a precipice. He also began to suffer from severe headaches. He became very nervous, and his memory was impaired. His eyes, too, became weak and his vision dim, and more lately he failed to recognise his own wife a few yards off.

About a year ago he began to get thin and weak. He could not walk far without resting frequently, and his back was so weak that he had difficulty in raising himself. He had constant tingling, numbness, and coldness of hands, feet, and legs as far as the knees, and a "wearing" pain in the loins. At night he had "cold shivers," which gave place to profuse perspiration and painful cramps of the toes, and, more lately, of the fingers also.

Eight or ten months ago he began to be troubled with frequency of micturition and occasional emissions, but he never lost sexual desire nor power.

Since the beginning of the year he has suffered from temporary ptosis occasionally, and all the other symptoms have gradually got worse. Early in April he became so weak and prostrate that on one occasion he fell to the ground. He had a violent attack of vomiting and purging, completely broke down, and had to give up his work.

Nervous System.—The headache the patient suffers from comes on when he breathes the vapour, and sometimes lasts for days. It is severe, burning, and darting in character; always on the left side shooting from the back of his head over his forehead and temple. He complains of numbness and coldness of the extremities, which are cold to the touch; also of a tingling, sometimes a pricking, sensation. Sensibility to impressions of touch and pain not much, if at all impaired, but that to thermal impressions

impaired in feet and legs as far as knees, and backs of hands as far as a little above the wrists; muscular sense normal.

Sight.—Vision is impaired. He can read only the largest print in a newspaper. Objects are blurred. On going into the light everything seems to be in a mist. He cannot distinguish the features of a person a few paces off. He can see, if anything, better in the dark. Glasses are little help to him. Dr Argyll Robertson, who kindly examined him, thinks the case may be complicated by tobacco amblyopia. He finds a central blindness to green and red. Fundus and disc normal, but slightly hyperæmic. Incipient peripheral cataract in left eye.

Smell.—Partial anosmia after exposure to the vapour.

Motor functions.—Organic reflexes. Micturition sometimes as frequent as every half-hour. Occasional seminal emissions. Reflexes superficial and deep, normal. No clonus. Muscular system greatly enfeebled. Muscles wasted and flabby. No group specially affected. No tremor nor twitching. Index of dynamometer raised to 70.

No tender point anywhere down the spine, nor is any pain elicited by the hot sponge test.

He is very thin and emaciated, and nearly all the subcutaneous fat has disappeared. He has lost two and a half stones during the last year.

The other systems present nothing further worthy of note.

II. Exhibition of Pathological Specimens.

1. *Dr W. Russell* showed—(1), A BRAIN presenting a lesion of considerable extent in the left orbital lobe. The condition appeared to have been one of gummatous softening. Over the seat of softening the dura mater was adherent. The basilar artery presented an aneurismal swelling. The LIVER from the same case showed cicatrices also, doubtless of syphilitic origin. (2), LUNGS, KIDNEYS, AND TESTICLE from the body of a patient who had suffered from anasarca and dropsy, which was believed to be due to chronic Bright's disease. The kidney showed that condition. The special interest of the case consisted in the presence of a testicle in a pretty advanced state of strumous degeneration, and in the further fact that there was an eruption of miliary tubercle in the lungs, this eruption having evidently been the closing scene in the clinical history of the case. (3), HEART AND PORTION OF LUNG from the body of a dispensary patient. When first seen she had been ill for a week, and had a temperature of 102°. There was a loud, rough systolic murmur all over the chest. The difficulty in the case was the diagnosis—whether it was vegetative endocarditis, or typhoid fever, or pneumonia. The problem as to its being typhoid fever became more complicated from the occurrence on the following day of diarrhœa. She was so ill that it was impossible to examine the

lungs satisfactorily, though Dr Russell was inclined to exclude both vegetative endocarditis and typhoid, and thought there was a patch of pneumonia, though he had not discovered its situation. He found post-mortem that the condition was due to an apical pneumonia at the back of the right lung. In addition there was an intense enteritis, but from what cause he could not satisfy himself. The heart was interesting from the loudness and roughness of the systolic murmur. There was no diastolic murmur, and the pulse had none of the characters of aortic regurgitation. It would be seen that the roughness of the systolic murmur must have been largely due to calcareous masses at the junction of the cusps with the endocardium. Two of the cusps were in part adherent, and would share in producing stenosis of the orifice. The patient had had an attack of acute rheumatism twenty-two years before her death, and they might presume that the cardiac lesion had its origin at that date, but during all these years no cardiac symptoms of consequence had manifested themselves. The mitral orifice was also stenosed, and the cusps thickened.

2. *Dr James Carmichael* exhibited the THORACIC AND ABDOMINAL ORGANS in a case of tuberculosis. The boy, aged 4 years, had been about three weeks in the Royal Hospital for Sick Children. The history showed that the child first began to complain three months previous to admission. He had not suffered from any of the acute ailments of childhood, and there was no hereditary predisposition to tubercular disease. The clinical features of the case showed rapid emaciation, with pulmonary consolidation, enlarged liver and spleen, and the mesenteric glands generally. On post-mortem examination, the body exhibited a most perfect example of universal tubercular infarction of all the organs and tissues. The lymphatic glands were everywhere, except in the limbs, much enlarged, tubercular, and caseous, those in the thorax being conspicuous by their size, yet there had been no signs during life of pressure on any important part. He would specially direct attention to the spleen, which was infiltrated throughout with tubercular masses, and showed a very interesting mass of tubercular infarction occupying an area five-eighths of an inch in diameter.

3. *Mr A. G. Miller* showed for Dr Sturrock of Golspie A GUNSHOT WOUND OF THE STOMACH. Two boys were out frightening crows with an old gun. They were entrusted with caps only, but had managed to get some powder, with which they had loaded the gun, using paper as a wadding. In crossing a dyke the gun exploded, and the contents lodged in the side of one of them, a lad aged 16, making a wound 1 inch by three-quarters, through which a large quantity of bowel protruded. Chloroform was given, the wound enlarged, and the intestine carefully examined for an aperture. None being found it was returned, and the abdominal

wound sutured. The lad survived eight hours, and on post-mortem examination it was found that the stomach had been wounded under the left lobe of the liver. In the wound, which was very large as compared with that in the abdominal wall, the newspaper wadding was found.

III. Exhibition of Drug-Vehicle.

Dr Foulis showed some syphons of potash-water in which was dissolved salicylate of soda. The whole syphon could be divided into twenty doses by gumming on to the glass a piece of paper marked off into twenty divisions. Some syphons contained 200 grains, and others 400 grains, of salicylate of soda, so that 10 grains or 20 grains of the salicylate could be given at a dose by simply letting the liquid run off to one division of the gummed paper. The same thing could be done with other drugs, such as the benzoates. These medicines were best taken dissolved in this way, and, added to milk or limejuice, were both palatable and pleasant.

IV. Original Papers.

1. THE RELATION OF GOITRE TO MENSTRUATION AND PREGNANCY, AND THE INFLUENCE OF THE SYMPATHETIC NERVOUS SYSTEM ON ITS PRODUCTION.

By Allen Thomson Sloan, M.D., Edinburgh.

The mere fact that goitre occurs much more commonly in women than in men would lead us to suspect that an intimate relation exists between the thyroid gland and the female generative organs.

In this country it is rarely met with in the male sex. Out of about 50 cases seen by me, 4 only occurred in men—1 in Penrith, 1 in Wishaw, 1 in Carlisle, and 1 in London. This proportion is even greater than that noted by other observers in England. In Hampshire County Hospital, in a period of ten years, of the 49 cases treated, all, with one exception, were women. In Chichester Infirmary Dr Forbes informs us that out of 70 patients only 2 were males. At Bishopton Grange, near Ripon, Dr Inglis, out of 111 cases, found that 6 only occurred in men; while Prosser, in Derbyshire, saw 50 cases, and none of these in man or boy. In Germany the proportion of males affected is usually given as about 15 per cent.; but at Salzburg Zillner found that of 96 men and 184 women in adult life in the public charitable institutions 21 per cent. of the men and 61 per cent. of the women were affected with goitre. In Switzerland and some parts of India, where the disease is more prevalent, the number of males affected is greater. Mr Greenhow was of opinion that sex had no great influence on

the disease, and Mr Bramley found it as common in men as in women. These Indian observers also found that goitre occurred at any age—was sometimes congenital, or affected children of tender years—but that it was most common between 20 and 40, though even in old age goitrous tumours had been known to develop.

Dr M'Clelland thought that no authentic case of congenital goitre had ever been recorded, but that the disease began at any period of life after the age of three years, and never arrived at its full size sooner than six years from the time of its commencement, but generally was much slower,—its progressive augmentation seldom becoming perfectly suspended during residence in an affected village. In this country goitre is said to occur chiefly between the ages of 17 and 24, and to be rare before puberty. Though 9 out of my 30 recorded cases occur in young girls under 17, and a few of the others describe the disease as commencing a year or two before the onset of menstruation, still the majority assert that simultaneously with the development of that function the thyroid was noticed to increase in size, and all agree that about this time growth seemed more rapid. In five of my Penrith cases the patients themselves or their friends have observed distinct enlargement of the goitre during the menstrual periods; but the others are doubtful that any change takes place, though most of them complain of an increased sensation of fulness in the neck, and greater breathlessness, which afterwards passes off. Enlargement of the thyroid gland is also common enough at this time without disease. Dr Inglis says, "it is at puberty that goitre generally commences;" and accounts for this by supposing that a surplus of blood is thrown into the thyroid in consequence of the diminution of the thymus gland, which occurs at this period of life. From his own observations, he found that in by far the greater number the disease had commenced at or about the time when the catamenia ought to have appeared; and, generally speaking, his patients had been irregular, the menstrual flow not having appeared till between the sixteenth and nineteenth year (*Treatise of English Bronchocele*). In my experience, enlargement of the thyroid seems more associated with an early rather than a delayed onset of menstruation.

According to Dr Reid, irregularity of the menstrual function has a very marked effect upon the complaint; and the majority of young females he saw with goitre were subject to some such irregularity (*Edin. Medical Journal*, 1836, p. 54).

Dr Copland has seldom met with an instance in the female unconnected with some kind of irregularity in the catamenial discharge or disorder of the uterine functions; and he never saw a case in which the disease made its appearance before the period of commencing puberty (Watson's *Practice of Physic*, p. 798).

Dr Hunter says "that the bronchocele frequently appears two or three years before or after the commencement of menstruation, and

that it sometimes spontaneously disappears when it goes on in a regular manner" (Cooper's *Surg. Dict.*, p. 238).

Suppression of the menses has been thought to act as an exciting cause of goitre, and a case is related by M. Brun, where, on the restoration of these, the tumour disappeared.

Dr Heath, of Torquay, records a case where a cystic tumour developed in connexion with the thyroid gland. Its first appearance was coincident with a suppressed menstrual period, and it suddenly disappeared on the resumption of that function the following month (*Brit. Med. Jour.*, 1879, p. 428).

Cases also are recorded where goitrous tumours previously of considerable size have grown smaller when the menstrual flow has become fully established and regular.

Dr E. W. Jenks, of Chicago, maintains the view that goitre has a close relation with the diseases of the female generative organs, for the following reasons:—"Goitre is less frequently met with in men than women, the proportion given being 26 to 474. It first appears generally at the time of puberty; and the thyroid gland, whether diseased or not, often enlarges at the time of menstruation. He believes that goitre is due to some derangement of the female generative system, the derangement being oftener functional than structural" (*Brit. Med. Journal*, 1881).

Sudden cessation of other discharges, such as leucorrhœa and gonorrhœa, are said to have been followed by swelling of the thyroid. Vicarious menstruation has even been reported to have occurred from the neck. Be this as it may, enlargement of the thyroid gland seems occasionally to be associated with disordered uterine function, and not unfrequently disappears on this organ regaining its healthy action.

Relation to Pregnancy.—In those cases where the goitre does not develop at or near the time of commencing menstruation, it not uncommonly appears during pregnancy; and all my married patients observed considerable increase in the size of the tumour at this period. In countries where goitre is endemic, pregnancy is one of the chief causes which favour its formation. According to Foderé, women who are not goitrous before marriage often become so in time of pregnancy. "During this epoch the sex in general is exposed to a swelling of the neck. In dry countries after delivery it returns to its normal state, but remains enlarged in goitrous countries" (*Traité du Goître et du Crétinisme*). M. Guizot has observed hypertrophy of the thyroid taking place in pregnancy, quite independently of the conditions usually considered to be favourable to the production of goitre. He records two cases which ended fatally, and the post-mortem examination showed great increase of the fibrous framework of the thyroid. "Supposing this to be a correct representation of what takes place in other cases of enlargement of the thyroid during pregnancy, the author is disposed to regard it as only one of the

manifestations of the excessive production of fibrine during pregnancy. To this is in great part due the progressive development of the uterus and mammary glands, and there is a simultaneity of production between these and the thyroid; and this is why he has been led to state that the hypertrophy of the thyroid during pregnancy is one of the consequences, as it is one of the proofs, of the energy imparted to the fibrous elements of the system" (*Archives Générales*, 521).

Dr Inglis states "that the greatest number of his patients noticed considerable increase of the tumour during pregnancy; and considers this to be due to the sympathy existing between the different organs, the uterus and mammæ, and perhaps also the thyroid, which even through the medium of the mammæ might be ready to receive morbid impressions" (*Op. cit.*)

The relation of goitre to pregnancy, and the marked effect that activity of the uterine functions seems to have in producing enlargement of the thyroid gland, are strikingly illustrated in the history of many of my cases, a few of which I shall now relate.

Case I.—Mrs H., aged 63, married, and has had four children, has a goitre, which began when she was about 21 years of age in the centre of the neck, and occasionally gave rise to aching pain, relieved by tight pressure of the hand. Menstruation occurred before she was 13, and the swelling increased very slowly from the time of commencement to the time of her marriage at 34, and then it was about the size of a pigeon's egg. During this period it was from time to time painted with iodine, and once or twice it nearly disappeared. Patient thinks there was no perceptible difference during the menstrual period; but whenever she became pregnant the goitre began rapidly to increase in size, until after her first labour it occupied the whole of the front of the neck, extending quite up to the ears. Patient states it was so large that she could not turn her head, and she had to lie and be fed. During the puerperal period it was painted with iodine, but at one part began to inflame, causing intense pain till it burst, when relief was got. It was also lanced, and from it sanious matter, not pure pus, was discharged, enough to fill a breakfast cup. After this it all disappeared except a small oval tumour the size of a walnut; and it remained small till patient became a second time pregnant, when it again rapidly increased in size, though it did not attain the dimensions it had at her first labour. It was kept reduced by assiduous painting with iodine; but in spite of this, during each succeeding pregnancy it increased rapidly in size. Her last child was born when she was 43 years of age, and she passed the climacteric three years afterwards. Patient states this caused no special diminution in the size of the swelling, which, however, was kept down by the constant application of iodine. Now the neck is occupied by an irregularly rounded swelling, the size of a large

cocoa-nut, though at one time it was like three eggs, the lobes being quite distinct. The original distinction is still apparent in the greater softness of the lobes over the isthmus. The latter is very hard and resistant—in fact, in some parts quite calcareous, as if a deposit of lime had really occurred. Evidence of old inflammation is found in adherence of the centre of the swelling to the upper border of the sternum and the sterno-mastoids on each side, which are considerably atrophied by pressure. The goitre produces no interference with swallowing or breathing, but causes an aching pain on the right side, which is relieved by firm pressure and the use of iodine. Both pupils are dilated, but there is no prominence of the eyeballs. Patient being thin, and the goitre somewhat pendulous, she supports it by wearing a small flannel bag round the neck, fixed by tapes behind. Patient has been resident in Cumberland for eighteen years, but the goitre began when she was in Liverpool. Afterwards she travelled about as ladies'-maid, so that local causes cannot account for its production. No relation of any kind was ever affected by the disease, and all her children are quite free from any enlargement of the thyroid. The above patient is an exceedingly intelligent woman, and along with her own case she gave me an account of one in a great friend of hers. This was a woman of the same age, also living in Liverpool, who developed a goitre of the same size at the same time. This was ascertained by measuring and comparing each other's necks. This patient got married at the same time, but "*had no children;*" and throughout the whole of her married life the goitre did "*not*" increase specially in size, but retained its original dimensions till the climacteric, after which it considerably diminished.

Case II.—A. S., aged 46, married, and has had five children, noticed her neck begin to swell when she was about 20 years of age, though menstruation began when she was 13. Even when the goitre first appeared it occasioned much breathlessness, and patient had often to rest going up a hill. She was married when 23, and a year after began to bear children. The goitre increased in size each successive pregnancy, though it diminished after labour, till at her last pregnancy it was so large, and occasioned such breathlessness, that several times she nearly died from dyspnœa, and her noisy breathing could be heard all over the house. Patient distinctly states that the swelling grew larger during each menstrual period, though, as she is now passing the climacteric, lately it has remained of the same size. There is now a general thickness of the neck of a very diffused character, the three lobes of the gland having all run into each other, and no part being larger than the rest. It still occasions great breathlessness on exertion and excitement. Patient otherwise has been very healthy. Her mother had a goitre, but none of her four sisters suffer from the disease, patient being the oldest daughter.

Case III.—M. C., aged 45, married, and with four children, suffers from a very large goitre affecting all the parts of the thyroid. The lobes are equal in size and softer than the isthmus, which is much enlarged and of firm consistence. At present the goitre measures from the external margins of the lobes across the most prominent part of the isthmus 11¼ inches. It began when she was about 12 years old, at which time patient also began to menstruate. The right lobe was first affected, and at that time was very soft. Patient is not certain whether it temporarily increased in size during the menstrual period, but states that it grew very gradually till she was 30, when after her first pregnancy it increased very rapidly in size. After labour it diminished, but again grew larger each successive pregnancy till within two years ago, when menstruation ceased. Previously it had only occasioned shortness of breath on climbing a hill. In this case there is distinct heredity. Her father had a swollen neck of the same nature, and a sister, two years younger, has a goitre which developed about the same time. This sister has been married ten years, but has had *no* children, and the swelling remains the *same* size as it was before marriage. A daughter of the above also suffers from goitre.

Case IV.—M. A., aged 44, married, and with *no* children, suffers from a goitre which has existed since she was 12 years of age, at which time she also began to menstruate. Since then it has gradually increased in size, perhaps more rapidly within the last three or four years. Patient was married when about 32, but having had no children, at no time noticed any very marked increase in the size of the swelling. Patient thinks there is a greater tightness and fulness of the neck during the menstrual periods, which still regularly continue. There is now a peculiarly prominent goitre of unusual projecting shape, due to extraordinary and distinct enlargement of the isthmus, which protrudes forward, and is fully the size of a duck's egg. Both lobes are also affected, the right much more than the left. Patient's father had a goitre, and, as already mentioned, both her sister and niece suffer from the disease.

Case V.—Mrs P., aged 47, married, and with ten children, suffers from a goitre about the size of a cocoa-nut. Both lobes are affected, the left lobe being soft, the right hard and of fibrous consistence. It used to occasion great breathlessness by pressure on the trachea. It began when she was 22 years of age, after the birth of her first living child, and grew progressively larger each successive pregnancy, but diminished to a slight extent after labour. At one time it was so large as to be on a level with the chin, and extended up under the ears. Since the climacteric, five years ago, it has gradually grown "smaller," and still continues to grow less. The only inconvenience complained of was great

breathlessness and noisy breathing at night, so that it could be heard downstairs.

It is unnecessary for me to detail more cases at present; from these, as from the others, the invariable course of the disease might be described as follows:—A woman has a goitre, which has developed at or near the time of puberty. For a few years it continues to increase very gradually in size, or even remains stationary, till after marriage. The patient becomes pregnant, and soon after the thyroid begins rapidly to enlarge, sometimes attaining enormous dimensions, and causing great breathlessness during parturition. After labour it diminishes, sometimes to its previous extent, but oftener remaining a little larger, until the next pregnancy, when again it rapidly assumes formidable dimensions, only once more to become reduced in size after labour. And this goes on each successive pregnancy until the age of child-bearing ceases, and the climacteric is passed, consequent on which there usually follows a distinct and permanent diminution, the tumour in some instances entirely disappearing. As striking, though not so constant a history, is that of goitre in married women who have had no children. In these, two of which I have recorded, "No" special or rapid increase in the size of the tumour was at any time noticed, and if it increased in size at all, it was by gradual, constant, and almost imperceptible growth. It is true that the whole glandular system of the female is much more developed during pregnancy than it ordinarily is; and the probability is, that at this period the function of the thyroid, whether mucin-excreting or hæmopoietic, is greatly increased.

When this stimulus of pregnancy is combined with powerful, or even slight endemic influences, might not an enlargement, which, in other circumstances, would be temporary and physiological, become permanent and pathological, and in this way the ordinary form of goitre most commonly result?

Influence of the Sympathetic Nervous System.—The influence exerted by the generative organs on the thyroid gland is most probably through the sympathetic nervous system, from the inferior and middle cervical ganglion of which its main nerve supply is derived.

M. Poincaré, in *Robin's Journal de l'Anatomie*, points out the great richness of the gland in nervous filaments of all sizes. This is the more curious since the gland presents no remarkable indications either of sensibility or mobility. No doubt the gland contains a large number of vessels which require constantly many vaso-motor fibres, but the nervous supply is out of proportion to what may be supposed requisite for this purpose. M. Poincaré thinks this peculiarity accounts in some measure for the close relationship known to exist between the thyroid gland and the generative organs, and believes that many of them are of a sensory nature (*Lancet*, January 1876, p. 616).

Dr Hawkes, of Maidstone, considers it has never been satisfactorily explained by what means the inhibition of hard water acts on a gland so remote from the centre of assimilation, and thinks it would simplify matters by regarding goitre "as the outward sign of a peculiar form of disease, which consists of a tendency to relaxation of the walls of particular vessels under the influence of a morbid condition of the ganglionic system." It is more common in females—(1) because they are more sensible to the causes from their more delicate organization and habits of life; (2), because they are habitually under the influence of the sympathetic nervous system in a far greater degree than the other sex, owing to their uterine functions" (*Lancet*, January 1861).

Dr Handfield Jones is of opinion "that goitre may with great probability be ascribed to a paretic condition of the vaso-motor nerves of the thyroidal vessels" (*Medical Times and Gazette*, January 1864, p. 630).

Dr Braxton Hicks supposes both exophthalmic and single goitre to be the results of local congestions. The tendency to local congestions being greater in women, this circumstance accounts for the greater frequency of both these affections in the female.

M. Nivet believes that the "disease may possibly be due to some rheumatic affection of the vaso-motor nerves of the thyroid gland" (*Medical Times and Gazette*, February 1878).

Dr Woakes says, "The point of departure in the morbid process consists in a paresis of the vaso-motor nerves, which mediate the vessel area constituted by the thyroid gland. The source of this paresis is the sympathetic ganglia from which these vessel-nerves issue; and the outcome of such paresis is a chronic state of vessel dilatation as regards the area in question." He considers goitre to be due to a defect in the vaso-motor centres regulating the blood-supply of the thyroid region, which defect has acquired the maximum of intensity by long ages of breeding in, added to hygienic surroundings of the worst conceivable description. In exophthalmic goitre the vaso-motor paresis affects a wider range of ganglia. The immediate cause of goitre is in most cases reflex, the condition of the sub-centres being inherently weak by heredity, and the effects of an over-wrought civilisation. A strong co-relation exists between the thyroid and the genital organs, there being evidence to show that fibres from the cervical ganglia are in direct continuous communication with the ganglia which preside over the circulation of the genito-urinary organs" (*Lancet*, January 1881, p. 448).

Professor Laycock emphasizes this relation very strongly in his clinical lecture on the "Goitrous Diathesis." After showing that the causes of goitre are purely endemic, he states that about 90 per cent. of the persons affected are women. "Where goitre and cretinism are endemic you have two classes of cretins, the goitrous and the ungoitrous. This difference depends really upon

the difference in the development of the sexual organs. The ungoitrous cretins are the most completely degenerate, for they present no marks of sexual development, even in adult age, being infants in this particular. Evolution of the body has in these cases been arrested either at the close of the first dentition or at the beginning of the second. We may, therefore, conclude that goitre is the result of the morbid actions of the sexual organs on the thyroid body, and that in 90 per cent. of ordinary cases it is the ovaria which have this influence. This action, I think, must be through the nervous system upon the vessels which subserve to the nutrition of the thyroid body, these vessels being branches of the carotid arteries, and the nerves from the cervical sympathetic. When endemic causes are absent, those which act on the sympathetic or nerve centres are usually sexual excess and depravity" (*Medical Times and Gazette*, January 1862, p. 450).

If we suppose the supply of blood to the thyroid to be increased by dilatation of its arteries, and its cell elements to have their nutritive actions increased by the loss of controlling nerve influences, hypertrophy must clearly result.

Whatever the true causes of endemic goitre may be, I consider that, given these endemic influences, the actual determining and exciting cause is not uncommonly pregnancy. In pointing out the close relationship between enlargement of the thyroid and disturbances of the generative functions, we are more able to account for its greater prevalence in women; and in considering the powerful control which the sympathetic nervous system exercises over the gland, we can better understand how, under the influence of certain special agencies, hypertrophy results, and goitre is produced.

Dr Tuke said he occasionally met with cases of goitre, especially in hysterical women. Two such cases he had under his care at present, goitre and hysteria both being present, but there was not the slightest menstrual irregularity, nor had such ever existed. That there was something deeper in the causation of this disease than had yet been got at, was shown by the fact that in the valley of Aosta, and in certain other goitrous colonies, the males affected were in excess of the females.

Dr Ireland thought Dr Sloan's study of these cases was a good contribution to medicine, but was of opinion that he had introduced a number of questions in which the functions of the body in their relations to cause and effect were somewhat bewildered. The weak point in his theory consisted in the assertion that goitre commenced about the age of puberty. Where goitre was endemic a large number of children was affected, and occasionally children were born with a small goitre. He did not see clearly the connexion between the organs of generation and goitre. There was no doubt a certain connexion between different organs of the body; but he agreed with Dr Tuke that there was a deeper cause at work

—it might be a miasm in the air or the water—and there was a degeneration over the whole body. He suspected that there were a good many kinds of bronchocele or goitre. Those sporadic cases that occurred in the towns appeared to him to be something different from what they had in the valley of Aosta. Dr Sloan had not made any reference to exophthalmic goitre. A great many observers held that this was due to some lesion in the sympathetic system. On considering the matter carefully, he thought the evidence stronger that it was connected with some change in the central nervous system. Brown-Sequard had produced exophthalmus by injuries to the restiform bodies. Dr Yeo had published a case in which there was a crossed exophthalmic goitre. He believed that goitre was more common in women than in men, even in those countries where it was very common; but there was no doubt that there was a vast number of men affected with goitre and cretinism, and affected before puberty. Kocher's experiments seemed to indicate that the thyroid might secrete something that was required for brain nourishment, and this might be the origin of the increase during pregnancy, two brains having to be nourished instead of one.

Mr Cathcart said he was at present engaged in reading an elaborate article by Wölfler of Vienna, who had investigated the enlarged thyroid glands removed by Billroth. The pathological conditions were found to be extremely varied. What were formerly called hypertrophies were now divided into various kinds of adenomata. It was interesting to notice that among the differently structured tumours there was found the feature to which Dr Sloan had drawn attention, namely, enlargement during pregnancy, not merely in the form of hypertrophy, but also of tumour growth.

Dr Peel Ritchie asked whether there might not be some connexion between the changes that occurred in the heart in the pregnant state and those that were described as occurring in the thyroid gland.

Dr Blair Cunynghame said the remarks of Dr Cathcart were borne out by therapeutics, because there were many goitres affected by iodine given externally or internally. On the other hand there were goitres, and those were probably adenomatous, in which iodine had no effect, showing a distinct anatomical difference.

Dr Tuke added that there were goitres which disappeared on the patients leaving their native places.

Dr Sloan said that in India and Switzerland men were commonly affected with goitre, but in other places women were most affected. He thought Dr Ireland had over-estimated the scope of his paper. He had carefully avoided referring to the endemic causes. It was quite possible that the heart changes were explicable in the same way as the thyroid enlargement, but he thought these were brought about in the same way through the sympathetic nervous system.

2. CASE OF MENINGEAL CEREBRAL HÆMORRHAGE AND MENINGITIS IN A CASE OF HÆMOPHILIA.

By Byrom Bramwell, M.D., F.R.C.P. (Edin.), Assistant Physician to the Edinburgh Royal Infirmary; Lecturer on the Principles and Practice of Medicine, and on Practical Medicine and Medical Diagnosis in the Extra-Academical School of Medicine, Edinburgh; Additional Examiner in Clinical Medicine in the University of Edinburgh, etc.

Mr J. B., æt. 18, the subject of the hæmorrhagic diathesis, but who had never previously complained of his head or manifested any nervous symptoms, slipped while skating on the 14th of January 1885, and fell, alighting in a sitting position on the buttocks.

He felt much shaken, and vomited immediately after the fall, which was, however, a very trivial one, and would probably have been unnoticed by most young men of his age.

During the next few days he continued to go about, complaining, however, of pain in the back of the head.

On *Jan.* 19*th* the headache was very severe; he vomited, and was obliged to go to bed.

From *Jan.* 19*th to Jan.* 31*st*, during which time he was attended by Dr Morris, and seen occasionally by Dr Drysdale and his uncle Dr Bonnar, of Stockton-on-Tees, these symptoms (severe pain in the back of the head and vomiting) continued, the temperature rose, and the patient became totally blind and partially unconscious.

On *Jan.* 31*st*, when I saw him with Drs Morris and Drysdale, the condition was as follows:—

He was semi-unconscious, but could be roused; answered questions when loudly spoken to, complained of pain in the back of the head, and moved his arms and legs when told to do so.

The pupils were widely dilated and quite insensible to light, the right being somewhat smaller than the left; the left side of the face was paralyzed, the conjunctival reflex on that (the paralyzed side) being much less distinct than on the opposite (sound) side; there was also paralysis with some resulting external strabismus of the right internal rectus muscle, and some loss of power in the left hand and arm, but none in the right arm nor in either leg.

So far as could be ascertained—but this point was not very satisfactorily determined owing to the semi-comatose condition of the patient—there was some loss of sensibility in each upper extremity.

The *plantar reflex* was very much diminished; the *knee-jerk* could be elicited on both sides, and was in no degree exaggerated.

There were no spasmodic twitchings, tremors, or convulsions. The *urine* and *fæces* were being passed involuntarily; a bed-sore had formed on the back.

The patient was totally blind even to a bright light thrown into

the eye with the ophthalmoscope. There was exceedingly well-marked, in fact intense, double optic neuritis.

The temperature was 102°·3 F.; and the pulse 98, regular, and of fair strength, the pulse wave being delayed, and the impression of a slower pulse, than was actually present, being conveyed to the mind of the observer.

During the twelve hours previous to my visit the unconsciousness had become greater, and all the other symptoms considerably aggravated.

The gums were spongy and inclined to bleed; the tongue was somewhat dry; swallowing was not interfered with.

The lungs, heart, and all the great viscera of the thorax and abdomen, including the peritoneum, were healthy.

Diagnosis.—The opinion which we formed as to the nature of the case was:—*Firstly*, that the patient was suffering from an effusion of blood at the base of the brain and some resulting meningitis; and, *secondly*, that this extravasation of blood had probably resulted from the fall on the ice which has been described above.

Prognosis.—In the presence of such grave and rapidly progressive symptoms, the prognosis was necessarily very serious; and had the condition depended upon any of the ordinary causes of meningeal hæmorrhage or acute basilar meningitis (such as tubercle, fracture of the base of the skull, perforation of the tympanic cavity by a suppurative inflammation, or epidemic cerebro-spinal meningitis), the prognosis must, I think, have been well-nigh hopeless; but believing, as we did, that these conditions (and also syphilis) could with certainty be excluded, and that the symptoms depended upon a blood extravasation the result of the hæmorrhagic diathesis and not of a ruptured aneurism, we ventured to suggest that there was still some probability of recovery, the grounds of which opinion were duly explained to the patient's friends.

Treatment.—The head was shaved and ice continually applied; the patient was placed on a water bed; good nutritious soups, jellies, and milk were given as food; and iodide of potassium, in ten grain doses, was administered internally.

Subsequent Course of the Case.—For the account of the after progress of the case I am indebted to Dr Morris, who very kindly took great pains to furnish me with careful notes of the subsequent course of events. He writes: "After our consultation on the 31st, the case assumed a more hopeless character; for some days there was low muttering delirium from which the patient could be roused, though for a time he was perfectly unconscious; the temperature rose, reaching as its highest point 104° F.; the pulse increased to 120; the respirations became spasmodic and irregular, and presented in a typical degree the Cheyne-Stokes' character; collapse threatened, *facies hippocratica* ensued, and the end was looked for. Aconite lowered the pulse to begin with, afterwards the great pros-

tration was relieved by brandy and champagne. Improvement then slowly but gradually took place."

On *Feb. 7th* the pupils responded slightly to a strong light, the left iris contracting in an irregular manner, first on the inside of the pupil, and in two days on the outside.

On *Feb. 12th* both pupils were still dilated, but slightly sensible to light. The patient stated that "he had gleams of light, but very indistinct."

In intellect he was now perfectly clear, and somewhat interested in passing events, and too much inclined to enter into conversation. When he became fairly conscious, fully three weeks had elapsed; this he could not at all understand. His illness, he said, "felt like the dream of a day."

The pulse and temperature were now normal, and the excretory functions naturally performed; the urine contained a slight trace of albumen, its sp. gr. being 1015. There was occasional slight hæmorrhage from the gums.

On *Feb. 17th* there was rather severe hæmorrhage from the bowels, which continued for three days. During this attack the iodide was discontinued, ergotine was injected subcutaneously, tannin and ergot administered by the mouth, brandy given freely, and lime juice *ad libitum*.

On *Feb. 19th* he said "he could see men as trees walking."

On *Feb. 26th* he had rallied from the bleeding from the bowels, but was attacked with severe epistaxis; it continued for six hours, and was finally arrested by subcutaneous injections of ergotine and plugging the nostrils.

On *March 7th* vision had so much improved that he recognised Dr Morris when he came into the room, and could tell the hour on his father's watch.

On *March 12th* Dr Morris wrote:—"Since the nasal plug was removed everything has progressed most satisfactorily; he is very happy and contented, and likes to be read to for a short time; very much pleased to have a chat with a friend, and making clear and intelligent inquiry about passing events. The left-sided facial paralysis was still very distinct, and there was still some loss of power and defective sensibility in the fingers, chiefly the ring and little fingers, of the right hand. The left pupil was now 3 lines in diameter, and contracted sluggishly under a moderate light; the right pupil measured 2 lines, and did not contract under any light. There was still double vision. Sight in the right eye was much more defective than in the left. When the right eye was shut he could see quite clearly, but when the left eye was shut the object was obscured, and the face of a man seemed distorted; when he looked steadily from the chest to the top of the head he said, 'Your head looks to me as if it had sunk between the shoulders;' and on looking from below up slowly there was always a point much more obscured than the other parts, which seemed to be the

result of a small band of the retina being deficient in sensibility." (This scotoma in the right eye was still perceptible when Dr Argyll Robertson examined the patient in September, see below.)

He was now almost free from pain, eating and sleeping well and making flesh. He always felt the atmosphere in a dull state, "as if," he says, "thunder were to follow." He sat up yesterday in bed for a short time.

It was agreed to substitute arsenic and iron for the compound syrup of the phosphates and strychnine, which he had been taking for some little time.

On *March* 26*th* there was a slight hæmorrhage from the posterior nares, which was stopped by the application of cold and compression of the carotids.

On *March* 30*th* he was dressed, and sat up for about an hour.

On *April* 10*th* he remained out of bed for six hours with comfort, and could read every alternate half hour with pleasure and profit.

On *April* 13*th* the pupils were nearly equal in size, and the reflex contraction to light was fairly good in both. The facial paralysis had almost passed away, but there was still slight strabismus; vision was still very dim, especially in the right eye; he could see best in a subdued light; bright sunlight pained him.

On *April* 15*th* he was up for the greater part of the day, downstairs for a time, and able to take a short turn in the garden. Though steadily improving he was still weak and anæmic. He occasionally felt a tightness over the forehead, but there was no headache.

On *May* 6*th* he came over to see me in Edinburgh; the facial paralysis had now disappeared; there was still slight strabismus and double vision; marked contraction of the visual field in both eyes, but especially in the right. On *ophthalmoscopic examination* both discs were seen to be undergoing white atrophy. He was advised to rest the eyes from all work for at least six months, to continue the iron, and to take strychnine.

On *September* 15*th*, when I again saw him, vision had distinctly improved; but as he was very anxious about the condition of his eyes, I sent him to Dr Argyll Robertson, who examined him, and kindly wrote me as follows:—"The atrophic condition of the nerves has, I have great hopes, become arrested, and there is a fair prospect that with a prolonged course of strychnine some further nervous energy may return. The contraction of the field of vision in the right eye is peculiar, but not, I think, of a bad type. He should rest his eyes from work for a few months yet."

Dr Argyll Robertson has since been kind enough to furnish me with the following additional notes of his examination:—"Has had double optic neuritis; has now white atrophy of the discs (not extreme); the retinal vessels somewhat contracted. Vision,

he states, has been recently improving. Left eye with — 0·75 dioptrics, V = $\frac{20}{50}$ nearly. Right eye, V = $\frac{20}{100}$. In right eye large scotoma in the field of vision, below and to the outer side, extending from about 30° to 60° from the centre; thereafter field of vision good towards the periphery. To the upper and outer side the scotoma extends from about 30° to the extreme periphery; to the inner and upper side the field of vision about normal. In the left eye there is no marked scotoma, except a small one below, about 30° to 45°, but peripheral vision to all directions much dulled.

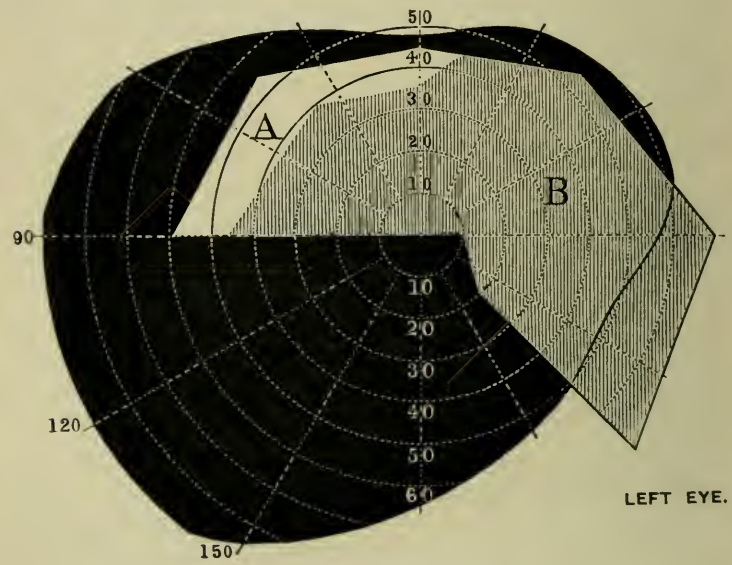


FIG. 1.—*Chart of the Field of Vision in the case of J. B.*

The dark area represents the extent of the normal field which was lost in this (the left) eye on March 30, 1886.

Vision was clearer over the area marked A than over the area B.

On the inner (nasal) side, the area of vision extends beyond the normal average (50°-55°) at the periphery.

The field for colours is not represented. The fields for blue, red, yellow, and green were all contracted. The yellow field was peculiar, inasmuch as it presented on the temporal side a long-tailed projection, which extended considerably farther outwards towards the periphery than the fields for blue and red.

Since the date of Dr Argyll Robertson's examination there has been progressive but slow improvement in the left eye, and some slight improvement in the right.

On *March 30th* Dr Stirling, assistant in the Eye Wards of the Royal Infirmary, very kindly mapped out the field, both for ordinary and coloured vision, with the result (for ordinary vision) shown in Figs. 1 and 2.

On *April 28th*, 1886, in answer to a request for a brief statement of his recollections of his illness during the acute stage and of his present condition, the patient wrote me as follows:—"I remember little or nothing of my illness from the fifth day or so after its commencement until I became conscious. I fell on the ice on the 14th January 1885, and took to bed with a severe headache on the 19th. The headache became more severe, and I fancied I saw strange things, such as screens and partitions hiding parts of the room. After this I remember nothing but dreams, except knowing that three doctors (Drs Morris, Drysdale, and

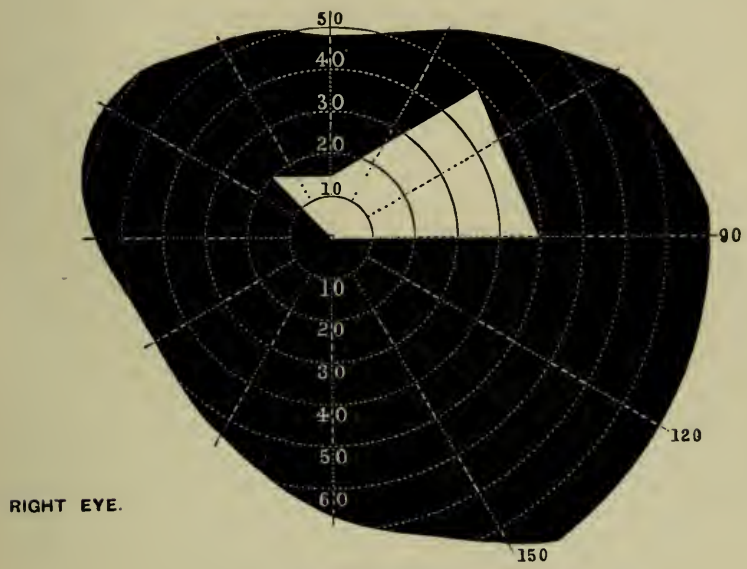


FIG. 2.—*Chart of the Field of Vision in the case of J. B.*

The dark area represents the extent of the normal field, which was lost in this (the right) eye on March 30, 1886.

The field for colours is not represented. The fields for blue, red, yellow, and green were all much contracted, the field for green being in this eye larger than that for yellow—a peculiarity which Dr Argyll Robertson tells me is somewhat rare.

Bonnar) came to see me, and then yourself; also having my head shaved. (*The following is obtained from friends*):—I was very low the same day as you were here; was unconscious for about three weeks. During these three weeks I always retained the power of swallowing and of speech. For one or two nights I seemed to suffer a great deal; was excited; breathing very rapidly until the breathing stopped for a few seconds—this last was repeated several times; became so low that I could not be moved in bed. (*From memory*) When I become conscious, found myself totally blind and very weak. Sight gradually became a little

better as I gained strength. I now feel almost as strong as ever I was. There is a little numbness in my feet and two or three of my fingers. My sight is still improving, and I am beginning to see a little with the lower half of my eyes. I have commenced to study music."

Remarks.—This case is one of great interest—*firstly*, because of the rarity of the lesion, if, as I think there can be little doubt, the symptoms were due to an extravasation of blood at the base of the brain and subsequent meningitis; and, *secondly*, from the fact that recovery took place after what I take to have been a copious meningeal hæmorrhage, and after the symptoms which have been described were developed, and even after the *facies hippocratica* was manifested.

The early appearance of such intense double optic neuritis, with such complete and early loss of vision, can only, I think, be satisfactorily explained by supposing that the extravasated blood had made its way into the vaginal spaces surrounding the optic nerves, and interfered with the nervous structures, partly by direct pressure, and partly by the inflammatory changes which were subsequently established by it.

That blood extravasated at the base of the brain does frequently take this course and tensely distend the vaginal sheaths, I have repeatedly been able to demonstrate *post-mortem* in cases of fracture of the base of the skull with extensive blood extravasations, and also in a case of aneurism of the internal carotid artery.

In that case, microscopical examination has further shown that the extravasated blood which made its way into the sub-vaginal space produced inflammatory changes in the pia mater covering of the optic nerves, swelling of the optic discs, and with what I take to be commencing neuritis, both in the optic discs and nerve trunks behind the lamina cribrosa. That the double optic neuritis may have been produced by inflammatory changes passing downwards along the optic nerves from the cranial cavity ("*descending neuritis*") must, of course, be allowed; but it is, I think, more difficult to account in this way (than in the manner which has been suggested above) for the facts that vision was so completely lost at such an early stage of the case, and for the early occurrence of such intense papillitis.

The important bearing which this case has upon the much disputed question of the mode of production of the double optic neuritis, which is so frequently associated with intra-cranial tumours, I hope to elaborate on some future occasion.

This case is also interesting inasmuch as it appears to be an example of isolated (non-hereditary or acquired) hæmorrhagic diathesis. The patient's mother died at the age of 45 from paralysis, having for 20 years been the subject of mitral disease; his father is alive and healthy; there were two other children—a brother and sister—both of whom are alive and well, and have

never manifested any hæmorrhagic tendency. There has never, so far as can be ascertained, been any hæmorrhagic tendency in any of his parents' relatives.

Dr Tuke thought Dr Bramwell was to be congratulated on the success of his treatment, and on the admirable manner in which he had brought the case before the Society. He should like to ask if the lymphatics he referred to in connexion with the optic sheath were perivascular.

Dr Bramwell said that there were vessels with them, but he was not sure that they were perivascular.

Dr Argyll Robertson could corroborate the details Dr Bramwell had given as regards the eye symptoms. When he saw the patient he presented all the characters of one who had undergone a very severe attack of double optic neuritis. The character of his vision was such as was to be observed where atrophy had resulted from inflammation of the optic nerve. One very interesting point in connexion with this case was the circumstance that, as far as one could judge from the history and course of the disease, the optic neuritis had resulted from extravasation of blood. Unless this was extensive it was rare to have double neuritis resulting. It was sometimes the result of simple inflammatory affections, but was more generally due to the presence of tumours in the intracranial cavity. As regards the causation of optic neuritis, while he could conceive the explanation given by Dr Bramwell as feasible and commendable, he did not consider it an essential view to take, because, though in a certain proportion of cases they found the vaginal sheath distended by fluid, there was a large number of cases in which this distension did not exist. Hence the difficulty of coming to a conclusion that in the cases in which this did exist with the optic neuritis there was any connexion between them. But those who held the theory that there was this distension of the vaginal sheath of the optic nerve, and that it produced the optic neuritis, some years ago introduced an operation with the view not merely of improving the condition of the optic nerve, but of the patient himself, by tapping the optic nerve sheath. He thought De Wecker did this, and stated that in some cases the eye and the general condition were both improved. But the difficulty arose that it was impossible to distinguish by ophthalmoscopic examination the cases in which this distension of the vaginal sheath existed from those in which it did not. With regard to the field of vision, he might mention that what Dr Bramwell had alluded to was peculiar, that in the one eye the patient had a much larger field of perception of green than usual. As a rule, the field for this colour was the smallest. That for red was the next smallest. Then came the field for yellow, and lastly that for blue. But in this particular instance the field for green very far overlapped that for yellow.

Dr W. Russell thought Dr Bramwell was to be congratulated on the diagnosis, and still more on the prognosis he had made in this most interesting case. Meningeal hæmorrhage was not uncommon in bleeders. Some years ago he had a patient who died of hæmophilia, in whom, it appeared to him, that death had occurred from a somewhat sudden hæmorrhage into the brain. He was unfortunate in not getting a post-mortem examination. In another case, one of purpura hæmorrhagica, in which he obtained a post-mortem examination, and in which death had taken place in a somewhat similar fashion, there was a meningeal hæmorrhage. He was interested in the symptoms which led Dr Bramwell to diagnose meningitis as well as hæmorrhage, because he had seen a case in Carlisle with a medical friend in which the difficulty was of diagnosis between meningitis and hæmorrhage. He thought the case was one of meningitis because there was pain in the head, a slight elevation of temperature—not nearly so much, however, as in Dr Bramwell's case—a degree of muscular rigidity, as if the cortical motor areas were irritated, also vomiting and partial unconsciousness, from which the patient could be aroused. She could move her limbs when asked to do so. There was paresis on one side of the face. It seemed to him that this was a case of meningitis, but when the patient died—coma having deepened suddenly and the paralysis become more marked—there was no meningitis, and the symptoms which had so closely simulated it were due to hæmorrhage into the meninges covering the cortical motor centres as well as other regions.

Dr Tuke asked if Dr Bramwell had no suspicion that the lesion extended higher up than the base, as some symptoms seemed to point to this, *e.g.*, transitory paralysis of the hand.

Dr Bramwell said the difficulty referred to by Dr Russell was a very real one—the difficulty of saying whether there was anything more than extravasation of blood. The distinct and long continued elevation of temperature, 102° going up to 104°, seemed in this case to indicate meningitis in addition to the extravasation of blood at the base. With regard to the point Dr Tuke had mentioned, he (Dr Bramwell) had called it a basilar extravasation, not meaning to indicate that there was absolutely no lesion higher up. The fact that there were no twitchings or convulsions seemed to indicate that there was no great extension of the inflammation over the cortical centres; the paralysis, therefore, could hardly be due to inflammatory pressure on the cortical centres. In reply to Dr Argyll Robertson, Dr Bramwell said that he had not in any way intended to discuss the causation of double optic neuritis as a whole, but simply the way in which it had been produced in this particular case. The facts that there was an extravasation of blood at the base (a condition in which Dr Bramwell knew from actual observation that the blood could make its way into the subvaginal sheaths, and produce localized inflammatory changes of

the optic nerves), the early appearance of the optic neuritis, its great intensity, and the very marked manner in which vision was affected quite at the early stage of the inflammatory process, were the reasons which led him to adopt that view. Possibly, on some future occasion, he might bring the whole subject of the mode of causation of double optic neuritis in cases of cerebral disease before the Society. That subject was one of great interest and difficulty, at which he (Dr Bramwell) had been working for some years.

Meeting X.—June 2, 1886.

Professor GRAINGER STEWART, *President, in the Chair.*

I. ELECTION OF NEW MEMBERS.

David Berry Hart, M.D., F.R.C.P. Ed., and Walter Scott Lang, M.B., F.R.C.S. Ed., were elected Ordinary Members of the Society.

II. EXHIBITION OF PATIENTS.

1. *Mr A. G. Miller* showed—(*a.*) A female patient suffering from a rare and somewhat interesting ATROPHY OF THE LEFT ARM. About twelve years ago she had a cellulitis of the forearm. As a result sloughing and hæmorrhage took place, and for this two vessels, probably the radial and ulnar arteries, were tied. The cellulitis spread up through the whole arm. The atrophy which followed had gone on progressing ever since. The skin was almost entirely replaced by cicatricial tissue. Sensation was present, but less on the dorsal than on the palmar aspect. In some parts there was slight hyperæsthesia. The muscles on the dorsal aspect were more completely atrophied than on the flexor. The extensors were almost gone, and the dorsum of the wrist was covered by cicatricial tissue so thin that the bloodvessels were distinctly seen through it. The palmar aspect of the hand was still natural. The fingers were distorted and contracted. The nail of the little finger had grown and was curled like a ram's horn. She had a certain amount of movement of the fingers due chiefly to the interossei. The flexors were felt to work, but the extensors barely. Pronation and supination were gone, but this was mainly due to fusion of the radius and ulna, the result of a fracture of both bones of the forearm, for which she first came under Mr Miller's care two years ago. The bones were also atrophied, not as regards their length, but as regards their circumference. There was ankylosis of the elbow, but the movements of the shoulder were almost perfect. The cause of

this peculiar condition was doubtful. The cellulitis was not sufficient to account for it. The ligature of the vessels would only account for atrophy on their distal side. There were marks of suppurations all over the body, which were probably the result of rupia or some other syphilitic affection, and there were other indications of a probable syphilitic condition. (*b.*) A man who nine months ago sustained a severe COMPOUND FRACTURE OF THE FOREARM. It was his duty to look after the engine which worked the water-pump for the Waverley Station. When the man was cleaning the engine some one set it agoing, and the crank came down on his forearm, causing a fracture of such severity that little more than the vessels and skin on the flexor aspect were left whole. Two inches of radius and three of ulna were then removed and the bones replaced. Though the wound healed they did not unite, and had afterwards to be cut down upon and wired. He had since made a good recovery.

Dr Byrom Bramwell showed in connexion with Mr Miller's first case a photograph of a fisherman suffering from phthisis, showing atrophy of the muscles of the shoulder and upper arm. He had fallen, when a child, on the shoulder, and had his arm bandaged in one position for two months, after which it atrophied. Though the muscles were atrophied the joint was very mobile. There appeared to be slight shortening of all the bones, but the remarkable point was that while the biceps and brachialis anticus were completely atrophied, no trace of muscular fibres being detected, with a strong faradic current (the best mode of examination in cases of this description) the patient could still flex the elbow; in bending it he first closed the fingers, then pronated the forearm, then flexed forearm on the arm, this movement being attended with supination. The pronators were largely developed. The triceps was completely atrophied. It was a little difficult to say what the lesion had originally been. The atrophied condition of some of the muscles was probably the result of disease.

2. *Dr Byrom Bramwell* showed a male patient, a slater, who some eight weeks ago was so well that he was able to work at his ordinary occupation as a slater on the top of a roof. He then began to suffer from weakness of the limbs, which had gradually progressed until he was hardly able to walk. The case was evidently a spinal one, probably, Dr Bramwell thought, a disseminated myelitis, associated with atheroma of the bloodvessels. It presented this remarkable feature, that there was in the left leg a most perfect knee clonus, but the ankle clonus on the same side was not present.

III. Demonstration of Modes of Treatment.

Dr W. Allan Jamieson demonstrated and explained a number of

NEW MODES OF TREATING SKIN DISEASES introduced by Dr Unna, of Hamburg. He observed that in the end of April he had gone across to Hamburg in order to see his friend Dr Unna, who had most courteously shown him the methods in use. Taking

(1.) *Eczema.*—This is much more frequent among civilized races, because the skin as a whole, and the horny layer in particular, become less resistent owing to the excessive amount of protection afforded. The anæmia of city life also favours the development of eczema, while the wear and tear of the nervous system affects injuriously its controlling power on nutrition. In treatment these circumstances must be borne in mind, and as a means of prevention all soaps which are alkaline or even neutral are contra-indicated. The true principles in the manufacture of a soap are—(*a.*) The use of pure fats only, and the avoidance of cocoa-nut oil, which, even in small proportion, dries the skin. (*b.*) The presence of an excess of free fat over the saponified alkali. The British public have been educated into the belief that a soap must lather in order to cleanse well; and to make a soap lather cocoa-nut oil is said to be necessary. But a soap will cleanse perfectly without lathering; and in Unna's overfatty basic soap the conditions laid down are perfectly fulfilled. This soap cleanses the skin most completely, but leaves it soft and cool; and when used for infants it obviates or cures the lichenous eruption so apt to appear within a few days after birth, and which is mainly due to the employment of an alkaline soap. This soap should be exclusively used by eczematously disposed persons.

The treatment of extensive eczemas is impossible with ointments and not satisfactory with lotions, the effect of which latter is ephemeral. For these, gelatine preparations were first introduced by Pick of Prague. His consisted of gelatine and water, which after being melted were painted on, and then the layer of glue thus formed on the skin was kept from cracking and peeling off by a thin film of glycerine smeared on. This plan was found troublesome, and, at Unna's suggestion, was replaced by his glycerine jellies, of which a valuable one consists of zinc oxide, 15; gelatine (Cox), 10; glycerine, 30; water, 40. This, when melted and painted on, forms a non-irritating adhesive layer. It can be covered with a film of absorbent cotton. It is specially valuable over joints, as at the bend of the elbow.

Dry Eczemas of the *palms* were formerly very intractable, and the only method of softening the warty masses was by means of solutions of caustic potash. This was apt either to do too little or too much. Unna has suggested that in these the peculiar action of salicylic acid on the horny layer of the epidermis in softening it and causing it to exfoliate might be serviceable. But for this purpose the acid must be retained in contact with the skin, under an impermeable dressing, such as the salicylic plaster muslins introduced by Unna, and made by Beiersdorf, Altona. By these the rough, thickened horny layer can be caused gradually and com-

pletely to exfoliate, and the surface thus exposed is ready to be treated with suitable ointments, or with *Salve muslins*. Those consist of fine muslin incorporated with consistent salves, and are made either one or two sided, the latter containing a more abundant amount of salve. Suitable pieces can be cut off and applied, and secured either with a turn of bandage, or the margins can be painted with glycerine jelly, and this covered with absorbent cotton. The salve muslins are of value on parts where there is comparatively little movement, or to complete the cure of cases carried so far by other means. Zinc ichthyol and lead salve muslins are those most in use.

Powder Bags.—On various parts of the body, but especially in eczema of the scrotum and of the inguinal regions in both sexes, the value of dusting powder is thoroughly recognised, but the effect of this application is transitory, as generally used. But by partially filling bags made of moderately porous cotton with powdered starch, and then quilting the bags to separate the powder, a continuous application of the powder can be maintained on the parts to which these are adjusted, as each movement displaces some. When they are used, the simultaneous employment of ointment is contra-indicated.

(2.) *Rosacea.*—This is met with in two forms. In one the tendency is towards acne vulgaris; the skin is thick, rather inactive, and the coexistence of acne pustules is common. In the other the skin is thin, the surface rough and somewhat eczematous. If acne be present the pustules are superficial, and with the dilated vessels and unnatural redness of the parts present in both forms, there is in the latter some degree of itchiness. In both Unna uses salts of sulpho-ichthyolic acid, especially the sulpho-ichthyolate of ammonia. This is a dark brown fluid, freely miscible with water, and possessing a peculiar though not disgusting taste and odour. It is administered in doses of 5 to 15 minims, freely diluted, twice a day. By its use internally and externally, Unna claims to have rendered rosacea easily curable; and Dr Jamieson's experience, though limited, was favourable. He had also found it exert more beneficial effects on chronic rheumatoid arthritis than any remedy he had tried. Externally in the acne form the use of very hot water, washing with ichthyol soap, and the application of a paste consisting of sulpho-ichthyolate of ammonia 3·0, dextrin, glycerine, and water, each 10·0 parts, was the treatment recommended. In the eczematous, zinc ichthyol glycerine jelly, painted on, or a lotion containing 10 per cent. of the sulpho-ichthyolate of ammonia, with adjusted starch powder bags, give the best results. The proportion of ichthyol in the jelly is 2 per cent.

(3.) *Lupus.*—The treatment of lupus has in the last decade undergone so many and such rapid changes as to lead to positive confusion. Since Volkmann introduced the sharp spoon, and Vidal and others multiple scarifications, the mechanical modes of

dealing with lupus held for a considerable time their ground. But the discovery of micro-organisms, though in small numbers, in the lupoid tissues, and the identification of these with the bacillus tuberculosis, had its influence on treatment. Besnier forcibly opposed the bloody methods of treatment on the ground that constitutional infection might so arise, and though the case was probably overstated, the effect has been to limit the employment of the curette and fine knife, or in accordance with the suggestion of Dontrelepont to dress subsequently with a weak corrosive sublimate lotion, as an antiseptic and parasiticide. But even thus the method was not found to be thoroughly effective. Cases undoubtedly were cured by those measures, but relapses occurred in some, and in others no advantage was gained, and the disease progressed. Nor was pyrogallic acid, as recommended by Kaposi and Besnier, better; while it is not in all cases innocuous, being apt to cause charring of the tissues and ulceration. At this stage, when distrust of old methods and the apparent failure of new had arisen, Unna steps in and offers a mode which seems to meet all requirements. In salicylic plaster muslin of various strengths the acid can be brought into the closest contact with the surface. Salicylic acid acts solely on the horny layers of the sound skin, never on the corium; but in lupus it acts on the diseased tissues, and dissects out the nodules, following the new growth into its fine ramifications along the bloodvessels. But it is painful, and on this account patients refused to allow its continued use. After many trials of anæsthetics, as cocaine, cannabis indica, opium, etc., Unna discovered that creosote, in the proportion of double that of the acid, perfectly obviated the painfulness, with one reservation. The creosote seems less rapid in action than the acid. Hence there is some pain for ten to fifteen minutes after application of the plaster; but this ceases, and is only aroused by the employment of a fresh bit of plaster muslin. If an actually painless method is desiderated, the part can be painted on the second and the subsequent applications with 4 per cent. cocaine solution, and in ten minutes the plaster placed on the patch. Three strengths of the salicylic creosote plaster muslin are made—10 per cent. × 20 per cent.; 15 per cent. × 30 per cent.; 20 per cent. × 40 per cent. In slighter forms, as in lupus of the cheeks, the milder form can be used; but a more rapid action is obtained by the stronger. The plaster is changed once or twice a day, the part being washed or wiped before the new plaster is applied. The piece of plaster adjusted should extend a little beyond the diseased area. In some cases the disease is destroyed, and cure effected by the plaster alone. In others, when sufficient destruction has been accomplished, the employment of it is discontinued, and a zinc salicylic plaster or salve muslin may be applied to heal the surface. Any subsequent redness can be removed by a zinc ichthyol glycerine jelly. Two patients under treatment were

shown, one all but cured, the other with healthy granulations in place of lupus tissue. These suggestions alone serve to place Unna in the foremost rank of living dermatologists.

IV. Exhibition of Pathological Specimens.

1. *Dr Johnson Symington* showed specimens of GENU VALGUM and TALIPES EQUINO VARUS.

2. *Dr Maclaren* showed the LARYNX and TRACHEA and portions of SMALL INTESTINE from a case of burning, which came under his care at Chalmers's Hospital.

Dr Littlejohn said he had no doubt as to the cause of death in this case. They found the blood on the right side of the heart coagulated, a condition which was never seen in cases of death by asphyxia. The mischief done to the pharynx was very like that usually done by a hot vapour. The serous membranes were affected, the pericardium in particular, almost giving the idea of a commencing attack of acute pericarditis. The points of special interest were the congestions of the duodenum and ileum close to the ileo-cæcal valve, where there was a clot under the mucous coat. These conditions sometimes went on to ulceration, but in thirty years' experience he had met with only one such case, in that the ulcer had opened in the duodenum posteriorly.

IV. Original Paper.

CASE OF A FULL-GROWN MALE FŒTUS, EXHIBITING THE RARE MALFORMATION OF A CYCLOPS.

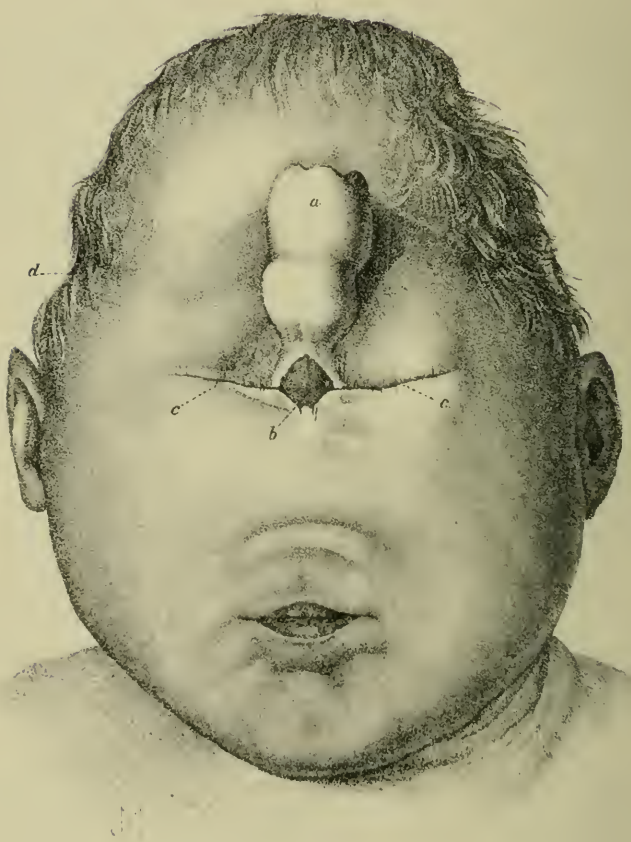
By William Craig, M.D., F.R.C.S. Ed., F.R.S.E., Lecturer on Materia Medica, Edinburgh School of Medicine.

WITH AN ANATOMICAL DESCRIPTION OF THE PARTS.

By Johnson Symington, M.D., F.R.C.S. Ed., M.R.C.S. Eng., Lecturer on Anatomy, Edinburgh School of Medicine.

At the first meeting of the present Session I showed to the members of the Society a full-grown fœtus presenting several malformations, the most remarkable of which was that known as a "cyclops." At the same time, I mentioned that I intended to have the parts carefully examined, and that a full description would be presented to the Society afterwards. The present communication is the fulfilment of that promise. The child was born three days before it was exhibited to this Society, and the members had an opportunity of examining the body when quite fresh.

There is not much to record regarding the obstetric history of this case. The parents were strong and healthy, and came from the country to reside in Edinburgh several years ago, and have



Front View.

a, Snout; *b*, lozenge-shaped space; *cc*, fissures between eyelids: *d*, constriction above pinna of ear.

since enjoyed excellent health. The mother is 45 years of age, and had previously six children, all of whom were natural and healthy. The youngest child is six years of age.

The presentation was a footling one, and there was an excess of *liquor amnii*, a condition of matters in my experience frequently associated with malformations of the hydrocephalic type. The labour was of short duration, and immediately on the completion of the birth of the child I discovered the peculiar malformation of a cyclops. The child was a male, with a well developed body, but the cranium was evidently somewhat imperfectly developed. The child was born alive, and it was fully twenty minutes before muscular movements entirely ceased. As it was evident that the child was truly "non-viable," I made no special efforts to prolong its existence, but it got every opportunity of living had that been possible. I do not believe that it was possible for this child to maintain a separate existence out of its mother's uterus. The mother made an excellent recovery.

This peculiar malformation is one, fortunately, very rare in man. I believe there is not a specimen in any museum in Edinburgh, although, as I have learned from Dr Symington, there is a similar specimen in the Anatomical Museum of the University of Glasgow, and several other cases have been recorded. It is more frequently met with among the lower animals, especially amongst sheep.

Believing that it was desirable in the interests of science that a careful description of the various abnormalities present in this fœtus should be furnished, I requested my colleague, Dr Johnson Symington, to perform this duty for me, holding strongly that such monstrosities should be dissected only by a skilled anatomist. It has been my lot more than most men to meet with interesting and rare malformations in my practice, and on previous occasions the dissections and anatomical descriptions have been by Dr Symington. I am sure the Society will agree with me when I state that I could not have entrusted this task to better hands; and I am glad to say that he has been enabled to dissect the parts in such a manner that the fœtus will still be available for an anatomical museum, and it will be deposited in the Museum of the Royal College of Surgeons of Edinburgh.

I have only to add further that when born the eyelids were quite closed. No eye was visible, there was only seen a transverse fissure (Plate, *c c*) in the centre of the forehead, caused by the apposition of the eyelids.

The following is Dr Symington's Anatomical Description of the Parts.

This specimen was a well-nourished male fœtus. It was 19 inches in length, had an ossific centre in the lower extremity of each femur, and, in fact, presented the usual indications of having been born at the full time. In addition to the cyclopean malforma-

tion this fœtus presented several minor abnormalities. There were six toes on each foot, but the supernumerary one on the right side was very small. The external genitals exhibited a slight tendency to resemble in appearance those of the female, for the fold of integument forming the scrotum passed upwards and inwards, so as to meet in front of the pubes in a somewhat similar manner to that in which the labia majora unite to form the mons veneris. The penis was small, and almost concealed by the above-mentioned fold. The left testicle had descended into the scrotum, but the right one was still in the abdomen.

The external appearances of the face are shown in the Plate, which was made from a life-sized drawing of a front view. The snout (Plate, *a*), which is represented turned upwards, was freely movable. It was about an inch in length, and was traversed in its whole extent by a single canal, which terminated in front by an opening at its free extremity. Below the snout there was a small lozenge-shaped space (Plate, *b*), the lateral angles of which were continuous, with fissures (Plate, *c c*) running outwards between the eyelids. The floor of this space was of a reddish colour, and appeared to be formed by mucous membrane, but there were no indications of an eye. The upper part of the head was smaller than normal, and presented a constriction (Plate, *d*) just above the level of the pinna of the ear.

Plate xlvii., fig. 3, of Ahlfeld's *Missbildungen des Menschen*, shows a specimen in which the external appearances were very similar to those in this case. Unfortunately the brain was very soft, so that its exact condition could not be accurately determined; but there was evidently only one cerebral hemisphere, and no indications of a longitudinal fissure. I could find no traces of the olfactory nerve, and there were only a single optic nerve and foramen, but all the other cranial nerves were present. In the dissection of this specimen special attention was directed to the condition of the bones of the skull and the formation of the orbital and nasal cavities. A few of the bones were apparently absent, some considerably altered in shape, and even those of normal configuration were smaller than usual.

The occipital bone consisted of four pieces—a basi-occipital, two ex-occipitals, and a supra-occipital; the latter was inclined more nearly vertical than usual. The squamoso-zygomatic and petro-mastoid parts of the temporal bone were firmly united together; they were very small, and rather irregular in shape. The parietals were normal.

The frontal consisted of a single piece, and there were no indications of a suture between its two halves. It had two distinct orbital plates, but the ethmoidal fissure between them was very narrow.

The changes in the sphenoid bone were almost entirely confined to its anterior part or pre-sphenoid. The body of the post-sphenoid

was well developed. The right great wing was united with it by bone, but the left one was still separated from it by cartilage. The internal pterygoids were united with the great wings. There were no indications of the body of the pre-sphenoid. The lesser wings were ossified, and between them was placed the single optic foramen, which was bounded by the dura mater.

A thin bar of cartilage extended forwards, in the middle line, from the post-sphenoid above the optic foramen to the root of the snout. At the upper part of the base of the snout two rudimentary nasal bones were found. They articulated with the frontal.

As already mentioned, the snout contained a single canal. On dividing the snout close to its base the canal was seen to communicate with two rudimentary nasal cavities. These cavities were surrounded, except in front and above, by a bony capsule. Their roof was formed by the thin bar of cartilage already mentioned, and the dura mater which was perforated by several small holes. The bone, with the dura mater and cartilage, formed a rounded capsule, which was little more than half an inch in diameter. On vertical transverse section it was seen to contain a mesial septum and two lateral cavities. The septum was well defined and reached to the floor of the cavity, but was not united with it. The outer wall of each cavity contained some irregular spaces which might be regarded as rudimentary ethmoidal sinuses. The septum, as well as the outer walls of the nasal cavities, was well ossified. The two superior maxillary bones were firmly united with one another, and both of them were devoid of nasal processes. There were no indications of pre-maxillary bones, and their absence was confirmed by an examination of the teeth as there were no incisors, each superior maxilla containing only three milk teeth—a canine and two molars. Behind the superior maxillary bones were found the palates, which were united with one another and with the maxillary bones. They were considerably altered in shape, and besides forming part of the hard palate, they extended upwards behind the bodies of the superior maxillæ to form the posterior part of the floor of the orbital cavity. The malars were normal, but no traces of the vomer or lachrymals could be found. The two halves of the lower jaw were separable, and contained the normal number of teeth. The single orbital cavity was bounded above by the frontal, below by the superior maxillæ and palates, and on each side by the malar and great wing of the sphenoid.

The optic nerve divided soon after entering the orbit into two branches, which were connected with two rudimentary eyeballs. The sclerotic and choroid of each eye were distinct, but the cornea, pupil, and lens could not be detected.

The part of the pharynx lying above the level of the soft palate reached as usual to the lower surface of the basi-sphenoid, but anteriorly it was bounded by the united palates, and there were no posterior nares.

From the above description it is evident that this specimen differs from the classical cyclops, since it had two eyes placed one on each side instead of a single mesial eye. Still it is really a well-marked example of the group known as cyclopean monsters. The malformation of the eyes is only one out of a series of defects found in these cases, as there is always imperfect development of the parts derived from the anterior cerebral vesicles, and extensive changes in the condition of both the cranial and the facial portions of the skull. The condition of the organ of sight varies considerably; in some cases there are two distinct eyes; these may be partially or completely fused into one, and in the most marked specimens the eyes are completely absent. I have not met with any description of dissections of human cyclops in which the nasal organ was similar to that in this specimen. The absence of the pre-maxillary bones and the upper incisors is what one might expect, but it is not often noticed. The tendency of the bones to early union in the mesial plane was well shown in the superior maxillæ, as, notwithstanding the absence from the palate of the pre-maxillæ, those two bones were firmly ossified together, and there were no indications of any notch in the anterior part of the alveolar arch.

Dr Byrom Bramwell showed a photograph of a similar case which he had exhibited to a Society some years previously. He had not had an opportunity of dissecting it, as it mysteriously disappeared after a meeting in Newcastle, and had not been heard of since.

Dr Symington remarked that a peculiar case of the kind had been recorded in the *Lancet* by an Australian practitioner, in which the fœtus was said to have lived six hours, to have moved its eyes about, and followed objects with it!

Meeting XI.—July 7, 1886.

Professor GRAINGER STEWART, *President, in the Chair.*

I. EXHIBITION OF PATIENTS.

1. *Mr A. G. Miller* showed a case of FÆCAL FISTULA in the left inguinal region. The patient was a man aged 54, on whom Littre's operation for colotomy had been performed. This operation, he considered, was easy of performance, and was one to which very little risk attached. He proposed at a later date to stitch up the distal end of the bowel in order to prevent fæces passing into the rectum, which, when it occurred, caused considerable pain.

Dr Bramwell asked whether Mr Miller thought that an operation in that position was more or less likely to be associated with peritonitis than the operation of lumbar colotomy.

Mr Miller said that in the published cases this was raised as an objection to the inguinal operation, but many of these cases occurred before the days of antiseptics, and he should not now consider it an objection.

2. *Dr James* showed, for Dr Brakenridge, a PATIENT at present in his ward in the Royal Infirmary. The man had an attack of right hemiplegia five months ago (Feb. 1, 1886). Descending sclerosis supervened, with increased reflexes and clonus in the right ankle and knee. More recently, Dr Brakenridge observed a similar increase of the reflexes and clonus in the left ankle and left leg, and what is perhaps more specially worthy of notice, that the clonuses of the left—that is to say, as far as the hemiplegia is concerned, the non-affected side—are more rapid than those of the right. I have timed these, and find them as follows:—Right ankle, 6 per sec.; right knee, 6·8 to 7 per sec.; left ankle, 6·8 per sec.; left knee, 8·6 per sec. It may be within the recollection of the members of this Society that some years ago I indicated a relationship between the rapidity of the clonus and the distance of the muscles concerned from their nerve centres in the cord, and that this was that the further these muscles were from their nerve centres the slower was the clonus. Thus the ankle clonus is slower than the knee, the knee than the hip, etc. This relationship is borne out by the case before us, as the knee is always quicker than the corresponding ankle; but the fact that the clonuses of the left side are quicker than those of the right shows that other and probably subordinate influences can affect the rate. What these are it is difficult to say, but we know, for example, that the tension of muscle is one. In the case of this patient the clonus of the right quadriceps extensor cruris can be increased from 6·6 to 8 per sec. as the result of tension.

3. *Dr Allan Jamieson* showed—(*a.*) a lad who since childhood had suffered from ICHTHYOSIS, affecting the whole of the outer surface of the arms, the greater part of the trunk, and thighs. Under Unna's overfatty soap and an ointment of resorcin, the skin was now almost perfectly smooth. He perspired freely over the chest and back. On certain parts there was a number of lines which seemed to be due to hypertrophy, but if the skin was stretched they were seen to be atrophic, and were due to the pressure of the ichthyotic plates. He had been under treatment for five weeks. (*b.*) The case of MORPHŒA which he had shown a year previously. Since then one of the masses of morphœa had enormously increased, and some had disappeared. Others had become less. No new ones had appeared on the head. He had, however, developed a morphœa in a new locality—over the front of the sternum, where violaceous patches were to be seen resembling those on the head. He was not certain whether there might not be a sarcomatous growth com-

plicating the disease on the chest. (Two days after, this man caught cold at the Exhibition, developed a pneumonia, and died. The growth from the sternum is being examined by Dr A. Bruce.)

4. *Dr Hodsdon* showed, for Dr Duncan, a woman suffering from CIRSOID ANEURISM. One operation had been performed, and it was practically cured. The needles were kept in for about twenty minutes. It was a curious fact that Dr Duncan had seen of these cases up to three weeks ago only eight in twenty years, but during the last three weeks had seen five.

II. Pathological Specimens.

1. *Dr Skene Keith* showed—(*a.*) A SARCOMA OF THE RIGHT KIDNEY, WITH ADHERENT INTESTINE, removed from a lady aged 49. When first seen she had in addition a large uterine fibroid and a sprouting mass at the umbilicus. The authorities in London had decided that the kidney tumour was liver, and advised that nothing should be done. As, however, she had not long to live on account of hæmorrhage from the growth at the navel, Dr Keith removed it. It was a round-celled sarcoma. Some months after he was induced to attempt the removal of the kidney; but finding that it was adherent to the peritoneum beneath the incision, he closed the wound. For the next year the patient led a miserable existence, due to frequent attacks of peritonitis, which several times brought her to death's door; and at last she persuaded Dr Keith to remove the uterine tumour. By this time menstruation had ceased; the uterine tumour was rapidly decreasing in size. A large part of the abdominal wall had to be removed attached to the tumour, which was closely adherent in every direction. It had burst through into the peritoneal cavity, and had become adherent there. A large amount of intestine had to be separated, and one piece, about 3 or 4 inches in length, had to be left attached to the new growth, and the ends sutured together. A drainage-tube was put in, and the wound closed. The operation was a very long one, lasting one hour and twenty minutes. The patient lived for six and a half days. A post-mortem was made shortly after death. There were signs of peritonitis, but on reaching the sutured intestines fæces were found on both sides of the join. On touching, part tore through. One end of bowel was healthy; the other, which had been injured when being separated off the tumour, had become gangrenous in part of its circumference. He had little doubt that had 5 or 6 inches more of the gut been removed, the lady would have recovered with very little trouble. (*b.*) An ENCEPHALOID CANCER OF THE RIGHT KIDNEY removed from a gentleman, aged 61. The operation was a difficult one, owing to the friable nature of the tumour and to adhesions to the capsule. Comparative little blood was lost,

and at the end of forty-eight hours they heard that the patient was very well; pulse 78, temperature normal. However, shortly after that he began to vomit, and died in twelve or fourteen hours. Extension of the disease into the renal vein was found on microscopic examination after death. (*c.*) A HYDRO-NEPHROSIS OF THE KIDNEY, which gave rise to great pain and inconvenience, and required tapping at intervals of a few months. The operation, due to the cystic condition, was much less difficult than either of the others, and the patient is now in good health. (*d.*) A UTERINE FIBROID, weighing 16 lbs., attached to a pregnant uterus, containing a three months' fœtus.

2. *Dr Cotterill* showed PORTIONS OF SEVEN RIBS resected in a case of empyema. Since the operation the chest had fallen in 3 inches, the pus was daily diminishing, and the patient had improved in every respect locally and generally. In addition to the bones, portions of the intercostal muscles and pleural sac were removed, leaving an enormous cavity.

3. *Mr A. G. Miller* showed—(*a.*) the PARTS from a case of INGUINAL COLOTOMY. The patient was an old woman who had suffered from an obstruction in the rectum for some months, and impaction of fæces. She had a fistulous opening between the rectum and vagina. She was in a very unfavourable condition for operation, but as she was very anxious to have something done, inguinal colotomy was performed. She died shortly after, and a post-mortem examination showed that suppurative peritonitis had occurred, but was confined to the immediate neighbourhood of the wound. (*b.*) Two CALCULI removed from a male cadaver sent him for class operations. There being a stricture, suprapubic instead of the usual lateral lithotomy was performed, and it was when assisting the operator that he found the calculi in the bladder. There had been septic cystitis, pyelitis, and pyo-nephrosis. The calculi were completely worm-eaten, probably from some chemical product in the urine, produced by the septic condition.

4. *Drs James* and *Bruce* showed MICROSCOPIC SECTIONS OF TUBERCULAR ULCER OF THE TONGUE. The specimen was taken from the tongue of a man, J. H., æt. 44, who had suffered from pulmonary phthisis for probably ten years. The disease was of the fibroid type, and was very chronic, and, with the exception of laying him up for some weeks on several occasions after somewhat profuse hæmoptysis, it did not until the beginning of last June prevent him from following out, in an easy way, his employment in an upholstery establishment. Last winter was, however, too much for him. At the beginning of it he had a severe hæmoptysis; after it hectic fever, which hitherto he had never experienced, supervened, and becoming gradually weaker, he died on 13th

February. The ulcer of the tongue began in June last on the right side, near the tip, as a small pimple. This bursting left a small ulcer, which gradually increased in size till at death, irregularly oval in shape, it measured about ¾ inch by ½ inch, and had a depth of about ⅛ inch. Its surface during life appeared granulated, and was usually covered by a grayish mucus. At times, however, this was absent, when it had the aspect of raw meat; its edges were quite level with the surrounding surface, and they were not swollen nor indurated, but were distinctly undermined. The surrounding mucous membrane was perfectly healthy. The patient did not complain of any great amount of pain; he suffered from it somewhat in eating, but not to anything like the extent usual in such cases. Salivation was not marked. There was no enlargement of the lymphatic glands beneath the jaw, and during the whole course of the disease there were no laryngeal, intestinal, or other complications. The only treatment was the use of borax and chlorate of potash lotions. Such ulcers, though not common, have often been described, and in Butlin's book, and in the *Transactions of the Pathological Society of London*, full accounts of them can be obtained. They are rarely the primary manifestations of tubercle, but, as in this case, are usually secondary to pulmonary disease. In connexion with their position, a point to which Dr James drew attention was that they were probably caused by infection from the sputum. They knew that if animals are made to eat tubercular matter the mucous membrane of the pharynx, etc., readily becomes infected. Now, the sputum will act similarly; and when we recollect that in the performance of the act of spitting there is great risk of abrasion of the front part of the tongue by the teeth, we can readily understand how inoculation is then likely to occur. Of course if the teeth are decayed, irregular, and sharp-pointed, the risk is much increased. A scraping of the ulcer during life was examined for bacilli. Why pain should be so common we can understand, when we remember that the tip of the tongue is the most sensitive part of the body.

5. *Dr Bramwell* showed—(*a*.) AN ANEURISM OF THE RIGHT INTERNAL CAROTID ARTERY. (*b*.) SPECIMENS OF CHARCOT'S MILIARY ANEURISMS from cases of cerebral hæmorrhage.

6. *Dr Philip* described the following IMPROVED METHOD FOR THE EASY DETECTION OF THE BACILLI OF TUBERCLE:—

While several of the modes at present in use for the detection of the bacillus tuberculosis are excellent, a certain amount of difficulty and awkwardness accompanies the usual line of procedure. Every one who has had much experience must have met with instances where such hindrance was considerable, the difficulty being largely due to (*a*) the comparative paucity of the

micro-organisms in relation to the other cell elements and the surrounding mucus, and (*b*) the extremely tenacious character of the mucus, which renders it no easy matter to obtain a suitably thin and equal layer on the cover glass.

The method, whose description follows, will be found to obviate both these inconveniences. It has the advantage, moreover, that in doubtful cases it renders the demonstration a matter of greater certainty.

The principle is essentially that of concentration, the concentration being obtained by a double process of incubation and precipitation or deposition. It is thus practically the same principle as that followed in the examination of the urine for tube casts and other solid elements, the peculiar character of the secretion in the case of the sputum making the carrying out of the principle more complicated.

The sputum of from twelve to twenty-four hours is carefully collected and kept as free from the access of foreign particles as may be. It is then exposed in a beaker or flask to the influence of a gentle moist heat for twenty-four hours, or longer if necessary. The mouth of the vessel should be protected with a thin piece of gauze, which permits the free entrance of air and moisture, while excluding the grosser impurities. The continuous exposure described may be most conveniently managed in a Koch's steam sterilizer, as used in bacteriological work, but this is not essential. Proximately good results may be obtained by a more homely arrangement, such as every kitchen will afford. In practice, I have found that the temperature best suited for the process ranges from 36°C.-39°C. I had adopted this range as that corresponding roughly with the range met with in an ordinary case of tuberculosis pulmonum, where we assume the organisms flourish luxuriantly. I have since discovered that Koch assigns 37°C.-38°C. as the optimum temperature for the growth and reproduction of a pure cultivation of the bacillus.[1] Though this range gives doubtless the most satisfactory results, considerable latitude is permissible where the arrangements for exact work are not so perfect—the limit for growth of the tubercle bacillus being fixed by Koch at from 28°C.-42°C.

At the end of twenty-four hours, it will be found that the appearance of the sputum has altered considerably. The heavier cell elements have separated and become deposited at the bottom of the vessel, while above this is a uniform layer of comparatively clear fluid. The alteration is most strikingly seen when the sputum subjected to the process was previously uniformly purulent and the individual portions nummular in form. The clear supernatant fluid may be decanted, or by means of a pipette a drop of the thick deposit may be removed from below and placed on a

[1] Koch, Dr R., quoted by A. de Bary, *Vorlesungen über Bacterien*, Leipzig, 1885, p. 40.

cover glass. It will be found that the drop has no longer a cohesive character, and may be spread with much greater ease and exactness as a uniform layer on an apposed pair of cover glasses. These, when dried, are stained and mounted according to any of the approved methods. Microscopic examination then reveals the advantage of the procedure. The heavier cell elements in their deposition have carried down the micro-organismal elements, so that the drop contains these latter in relatively increased number. I have found in some instances that the consequent multiplication has been five times or even more.

While this increase is to be attributed in large part to the precipitation and resulting concentration, I am inclined to think that there is also an absolute increase, which is to be regarded as due to the process of incubation to which the sputum was subjected. For in addition to the evident multiplication, I have been able to trace what appear to be signs of more active proliferation. This may seem to be opposed to the observation that the growth and development of the tubercle bacillus in artificial cultivation, *e.g.* on blood serum, is but slow. It may be, however, that the sputum is a medium better suited for its development. The fact of the extreme abundance of the organisms in the sputum in certain cases lends support to this view. In some of the preparations, in addition to the signs of increased number, the grouping and the variety in size and shape is very striking. The scope of the present paper, however, forbids my entering more fully on this interesting point.

At first sight the process, as I have described it, appears lengthy. In reality, I believe it to be more expeditious, the preliminary steps not necessarily involving any special preparation. It is rather a question of delay. The latter part is a distinct advance on the older method, as (*a*) allowing the detection in all cases to be more rapid; (*b*) insuring a greater probability of success in doubtful cases; (*c*) overcoming some of the minor difficulties which are inseparably connected with the other methods.

III. New Instrument.

Dr Philip showed a NASAL INSUFFLATOR, which he had found of considerable value. It was largely used in Germany. He believed that in many cases of disease of the nasal cavity treatment, carried out by means of dry powders, was more efficient than treatment with the douche. With such an insufflator, soothing, astringent, antiseptic, and other remedies could be conveniently exhibited. On the Continent it was much in vogue for the exhibition of quinine in pertussis.

IV. Original Communications.

1. ON THE COLD NITRIC ACID TEST FOR ALBUMEN IN THE URINE AS AN AID TO THE DETECTION OF THE BILE SALTS.

By John Stevens, M.A., M.B., C.M., Ettles and Stark Scholar.

In testing for albumen by the cold nitric acid method it is sometimes observed that there is in the column of urine, a little above the line of contact of the two fluids, a layer of precipitation quite distinct from the precipitate of albumen produced by the nitric acid. This is distinguished from the precipitate of urates which sometimes occurs by not disappearing when heated. When observed at all it has been described as mucin precipitated by the acid. Dr Maguire has recently referred to this reaction in an article in the *Lancet*,[1] and, while describing it as the mucin reaction, has expressed doubt as to whether it is really due to mucin, because he has never found it apart from the presence of albumen, and he has seen it in urines in which acetic or citric acid did not precipitate mucin. This corresponds in the main with my own observation. I have sometimes, however, noticed a very slight precipitate occurring in the same position in urines containing no albumen, and this slight precipitate is, I believe, correctly ascribed to mucin. The upper precipitate observed when albumen is present is often, however, much more dense than this faint mucin precipitate, and it is evidently to this more dense precipitate that Dr Maguire refers. I have lately, under Professor Grainger Stewart's directions, been making a series of observations on the urine in a case of cyclic albuminuria, and have found that in samples of the urine which contain albumen this reaction is well marked, whereas it is absent in samples which do not contain albumen. I have observed it very distinctly in several other albuminous urines lately; and, further, it is present only in *some* albuminous urines, not in all.

What, then, is the condition which leads to its presence? I have come to the conclusion that *it is due to the bile salts precipitating the albumen when the urine has been properly acidified, and that, when the reaction is well marked, it is an indication that the bile salts are present in excess.* Dr Oliver of Harrogate has recently shown[2] that if an albuminous urine is acidified with citric or acetic acid the albumen is precipitated by a solution of bile salts; and that if, as sometimes happens, an albuminous urine contains the bile salts in excessive amount, the addition of a small quantity of organic acid will lead to a precipitation of the proteid. The same thing occurs if, instead of albumen, there is peptone

[1] *Lancet*, 12th June 1886, p. 1108.

[2] *Bedside Urine Testing*, 3rd ed., pp. 205 and 207.

present; and Dr Oliver has taken advantage of this fact to elaborate an extremely delicate method, not only for the detection, but also for the quantitative estimation, of the bile salts in the urine by means of a standard solution of peptone acidified to the proper degree with acetic acid.[1]

The action of nitric acid will be readily understood from what has just been said. At the line of contact strong nitric acid precipitates the albumen, but it also mixes to some extent with the column of urine above. Now, it is only at a certain degree of acidity that the bile salts can precipitate albumen or peptone. The lower part of the column of urine is too acid, while the upper part, if too much mixing of the fluids has not occurred, is not sufficiently acid. It is thus only at a certain level that this bile salt precipitation of albumen occurs.

That the bile salts are the real precipitants may readily be proved by taking an albuminous urine which gives no reaction except that produced by the nitric acid, or which only gives in addition a faint precipitate like that sometimes due to mucin in a normal urine. If to this urine a few drops of a solution of taurocholate of soda be added, and the cold nitric acid test applied, there will be produced, not only a precipitate by the nitric acid, but also a well-marked precipitate higher up, the density of which depends, if there is a sufficiency of albumen present, upon the quantity of bile salts added. If, again, two urines be taken, one with an excess of bile salts, and the other with albumen but without excess of bile salts, nitric acid will give no reaction with the first, and, if any, only a slight upper precipitate with the second. But if a little of the albuminous urine be first added to that with excess of bile salts, nitric acid will give not only the ordinary precipitate at the line of contact, but also a well-marked precipitate higher up than, and quite distinct from, the other. This indicates how the bile salts may be detected when there is no albumen in the urine.[2]

There is one condition in which the bile salts will produce a precipitate in the absence of albumen—namely, when there is peptone present. I have not yet met with this, but on adding a little peptone to a urine with an excess of bile salts, this reaction can be distinctly obtained. Thus, while nitric acid does not itself precipitate peptone, it supplies the requisite degree of acidity in presence of which the bile salts precipitate that proteid. A precipitate so produced might be inadvertently mistaken for albumen, but it is distinguished from that by occurring not at the line of contact of the acid with the urine, but a little higher up. This

[1] *Bedside Urine Testing*, 3rd ed., p. 209.

[2] The test is in no way interfered with by the addition of a little carbolic solution to the albuminous urine; and, as urine so treated may be kept for any length of time, the inconvenience of requiring an albuminous urine is reduced to a minimum.

well-marked precipitate occurring in the absence of albumen is thus an indication of the presence both of peptone and of an excess of bile salts.

This combination of peptone and excess of bile salts, though it has been observed by Dr Oliver,[1] is a rare one, whereas the presence of an excess of bile salts alone in the urine is not infrequent, and the reason why so little attention has been paid to their detection is, I believe, mainly because there has been no satisfactory test for them of such simplicity as could be used in clinical work.

So delicate is this test, that when the albumen is in small quantity the bile salt reaction may be as distinct as that produced by the nitric acid, and it is sometimes the more distinct of the two. Not only does it occur when the bile salts are present in excess; even the small quantity which is excreted in health often suffices to give a slight reaction, especially if the urine is concentrated. As the extent of the reaction which may occur in health varies with the concentration of the urine, it is well to dilute concentrated urines to about the normal specific gravity before applying the test in order to diminish this variability.

The precipitate of mucin produced by nitric acid resembles the albuminous precipitate produced by the bile salts in being soluble in excess of the acid, so that it also forms a layer at a certain height in the column of urine, and may be indistinguishable from the slight albuminous precipitate produced by the bile salts when these are not in excess. Dr Oliver has, however, shown[2] that the bile salts precipitate mucin as well as albumen, and he suggests that this is the explanation of the precipitation of mucin in the urine. But it seems more probable that the faint precipitate of mucin which may occur in normal urines is due to the acid added, whereas the more dense mucin precipitate, which occasionally occurs at least in jaundiced urines, is to be ascribed to the presence of an excess of bile salts. At any rate, the only occasions when I have observed a really dense mucin precipitate have been in cases of jaundice with excess of bile salts in the urine. This precipitate of mucin by the bile salts appears to differ from the ordinary slight mucin precipitate, in the fact that it is much less readily soluble in excess of the acid. Thus, in non-albuminous jaundiced urine, a well-marked precipitate is sometimes produced by cold nitric acid, extending from the line of contact or a little above it for a considerable way up the urine, forming a diffused opacity which, from the closeness of its lower part to the line of contact, might at first be mistaken for albumen. It requires considerable mixing with the acid to dissipate this precipitate, whereas the mucin precipitate produced by the acid itself is so readily soluble

[1] *Lancet*, 18th April 1885, p. 701.

[2] *Bedside Urine Testing*, 3rd ed., pp. 110, 111, and Addendum on Mucin and Bile Salts.

in excess that it only appears some distance up in the column of urine. This well-marked precipitate of mucin is therefore not a source of fallacy, but is actually an indication of the presence of an excess of bile salts. If a precipitate of mucin by the acid alone is ever so dense as to be a source of fallacy at all, it must, I think, be extremely seldom.

In doing the test it is necessary to prevent too much mixing of the acid with the urine, and also too much shaking of the urine. If the urine is rendered too acid the reaction will not occur, and, if it is shaken, the precipitate is very readily caused to diffuse through the urine, and so the delicacy of the test is lost. It can be readily done in the ordinary way by running a little nitric acid very carefully down the side of a conical glass after a considerable quantity of urine has been added. I have generally, however, done it by first pouring a little nitric acid into a test tube, and then passing the urine through a piece of filter paper held at the mouth of the slanting tube, so as at the same time to clarify the urine, if that is necessary, and, by letting it run down very gently, to obtain a well-defined line of contact with as little mixing of the two fluids or agitation of the urine as possible. When the test is done the former way the precipitate appears much higher up in the urine than when it is done the latter way, because of the greater diffusion of the acid. If the excessive mixing and the shaking were avoided the reaction would, I think, be oftener observed.

When we recognise the degree of reaction which may be present without excess of bile salts, we are able by this method to detect with readiness the presence of an excess of these substances. Its use may be illustrated thus:—Two samples of the urine were one day tested in a case of cyclic albuminuria, in which there was found to be a cyclic character in the excretion of the bile salts, as well as in the loss of albumen. Both were almost, if not entirely, free from albumen. On adding a little of the same albuminous urine to each and doing the nitric acid test, the one gave the reaction very distinctly, whereas in the other it was barely perceptible. Then by quantitative estimation it was found that that which gave the distinct reaction contained between three and four times the maximum quantity of bile salts present in health, whereas that which gave the very faint reaction contained considerably less than the normal maximum.

Dr Oliver's method for the quantitative estimation of the bile salts is well suited for special clinical investigation, but it may be doubted whether it can ever be used in ordinary work, as there is considerable difficulty and trouble in obtaining and having always at hand a thoroughly reliable test solution, and as a solution of peptone requiring careful preparation comes to be a matter of some expense. A simple qualitative method for general use, which can be done quickly and without any special apparatus or

reagent, is a want which has not yet been supplied.[1] The method here proposed, if found satisfactory, will, I think, meet this want, and it may further prove of service by indicating in what urines it would be desirable to proceed to a quantitative estimation.

2. THE BRONCHIAL CATARRH OF CHILDREN.

By James Carmichael, M.D., F.R.C.P. Ed., Physician to the Royal Hospital for Sick Children, Edinburgh University Clinical Lecturer on Disease in Children.

The liability of children to catarrhal complaints is one of the leading characteristics of disease in early life. The bronchial catarrhal affections stand out prominently in this country as among the commonest and most fatal of the diseases we meet with in pediatric practice. Healthy children are liable to be thus affected under a variety of circumstances, still more so are those debilitated from whatever cause, either acute disease or constitutional depravity. In rachitic children particularly such ailments are frequently met with, and are apt to become intractable and dangerous.

I purpose giving a short sketch of the clinical features and complications of bronchial catarrh in children, and offering a few remarks on the general management and therapeutic treatment of the various conditions. In doing so, I limit my observations chiefly to acute primary or idiopathic bronchial catarrh occurring during the dentitional or predentitional periods of infant life. It is at these epochs that we meet with the peculiarities which distinguish the disease at this time from that occurring in childhood or adult life, and which invest it with such special interest and importance. It is well known that in the extremes of life there is a greater liability to bronchitis than there is in the adult or middle period. The hypersensitiveness and activity of the mucous surfaces in children render them specially liable to such affections, doubtless in obedience to the law of evolution of disease, which holds that organs and tissues are prone to disease in direct proportion to their normal or physiological activity. In healthy children we are fairly entitled to say that there is relatively a greater proneness to the production of such diseases than in adults. In the case of children debilitated from various causes there is even a more marked predisposition to such affections.

Among the causes which tend to produce bronchial catarrh, *climatic influences*, in this country, stand out prominently. Fre-

[1] The above sentence was written before any account had appeared of Professor Matthew Hay's interesting researches on the subject of the bile acids, in the course of which he has found that they have a remarkable lowering effect on the surface tension of fluids. Taking advantage of this property, Professor Hay has devised a very delicate test for them, apparently so simple and so easily done as to be well fitted for clinical work.

quent and sudden changes of temperature, and cold and damp winds, must be credited largely in their causation. After epidemics of hooping-cough or measles there is a special disposition to pulmonary and bronchial attacks, especially during winter and spring.

Anti-hygienic conditions likewise play a not unimportant part in this connexion, by lowering the tone of the system and depressing the vital powers, thereby diminishing the ability of the child to resist the exciting causes of the disease. Associated with these, the next cause deserving of note is *deficient or improper clothing*. This, no doubt, operates in a large number of cases, and although it is chiefly among the poorer classes, mothers in better circumstances are not altogether free from blame in this respect. It has always appeared to me a barbarous custom that infants should be dangled about with bare arms, and after they are short-coated with bare legs also. Nothing can be said in favour of the custom, except that it has been to a great extent the fashion, and that it panders to the vanity of mothers who are proud of displaying the natural beauty of their children. Surely common-sense would dictate that infants are at least as liable, we believe more so, than adults to catch cold by having their extremities exposed. During the *dentitional period* children appear to be specially prone to catarrhal attacks. At this time the physiological activity of the process is concentrated in the buccal cavity, and with this the gastro-intestinal and bronchial mucous membranes show a close sympathy. One of the most frequent conditions with which bronchitis is associated is *rachitis*. Here the defective state of nutrition of the body generally and lowered nerve tone are important elements, no doubt, in causation, and if, in addition, we have softening and deformity of the bony walls of the chest, all the conditions are present which interfere seriously with the physiological activity of the lungs, inducing more or less blood stasis and passive congestion, along with which is sooner or later associated a more or less chronic catarrhal condition of the bronchi, and often pulmonary collapse.

The clinical features of bronchial catarrh in the child necessarily vary according to its previous condition, and the extent to which the bronchial tubes become involved. The disease often begins, as in the adult, with a coryza, and spreads by continuity of surface to the tracheo-bronchial mucous membrane. As a rule, the symptoms of bronchitis are better marked or more acute in a previously healthy child than in a cachectic one, in whom the complaint is often of a sub-acute and insidious character. In acute cases cough is generally a prominent symptom. At first hard and dry, it soon becomes loose, as the secretion from the inflamed bronchi is established. The child does not perhaps otherwise show signs of illness. There may, however, be only a slight cough, and even no rise of temperature. The child may be lively and happy with its playthings, and the disease go on unheeded till the medium-sized and smaller

tubes are affected, when the symptoms all become aggravated. It is in these circumstances that the practitioner is generally called in to see the child. The physical signs in the slighter forms of the disease are generally limited to a somewhat harsh vesicular respiratory murmur, accompanied by a few sibilant rhonchi heard chiefly in the inter-scapular region. The temperature seldom rises much above normal; the pulse and respirations are only slightly, if at all, accelerated. Very different are the symptoms and physical signs when the bronchial tubes are more extensively involved. Then we have all the features of bronchial catarrh well marked: hurried respiration, varying from 40 to 50; accelerated pulse; temperature ranging from 90° to 101° or higher, pretty regular, and not characterized by great remissions. The physical signs are generally characteristic. During the first few days the respiratory murmur is high pitched and often harsher than natural, with few accompaniments other than those of a dry character. These signs are soon succeeded by crackling mucous *râles* heard generally over the chest, both during the inspiratory and expiratory acts. These mucous *râles* are the most characteristic sign of

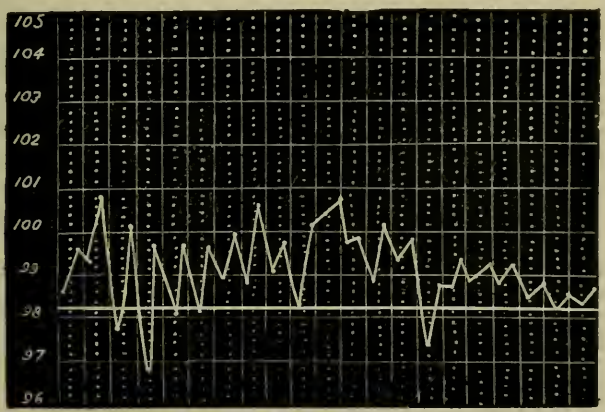


Fig. 1.—Bronchial Catarrh severe, uncomplicated Recovery.

extensive and fully-developed bronchitis in the child, and are relatively more copious and frequent than in similar conditions in the adult. They are heard, as a rule, generally over the chest, but most numerous posteriorly in the mid-scapular regions and at the bases of the lungs. In a previously healthy child such a condition as this, under careful treatment, may end satisfactorily in from ten to fourteen days, the physical signs gradually disappearing and convalescence becoming established. In a delicate child, or in any case where the disease does not show signs of amelioration within a reasonable period, the case may either become chronic, or extend to the minutest bronchial ramifications, in which case the

symptoms assume a more severe character, and serious complications are apt to arise. When *capillary bronchitis* becomes developed there is an aggravation of all the symptoms. The pulse is much accelerated, the respirations run up to 50 or 60, or even higher, the countenance becomes dusky and livid, and the alæ nasi act visibly, the cough at the same time is more frequent and distressing, the mucous *râles* more copious and general. Signs of gastro-intestinal disorder are generally present,—a coated tongue, unhealthy evacuations, often diarrhœa. The greater tendency of the catarrh to extend to the minute bronchi, and the almost inevitable occurrence of further complications, are leading characteristics of, and constitute the great danger in, this disease in children. The complications likely to arise as a secondary result of bronchial catarrh invest the disease as occurring in early life with peculiar interest, and it is to warding off these that all our efforts as physicians should be directed. The complications alluded to, I need hardly say, are pulmonary collapse, with its compensatory emphysema and catarrhal pneumonia.

A consideration of the clinical features of pulmonary collapse will, therefore, naturally engage our attention. Acquired atelectasis, as it is called, is of common occurrence—perhaps more frequent than is generally supposed, except by those who are much engaged in the treatment of disease in children. It is a condition which is generally associated with the more extensive and severe forms of bronchial catarrh, but is not unfrequently met with in young children even in the milder forms of the disease. Perfect recovery and reinflation of the collapsed lobules may take place. On the other hand, these portions of lung may either remain in a permanently atelectic condition, or catarrhal pneumonia be ultimately developed in them. An early recognition of the occurrence of collapse is of primary importance, as prompt and energetic treatment is successful in a certain proportion of cases in inducing reinflation, and preventing the occurrence of further complications. The causes of pulmonary collapse are mainly of a physical nature. It may be stated generally that anything which mechanically interferes with the normal mechanism of the respiratory act in a child will tend to produce it. In considering the etiology of this condition it is desirable to allude, in the first place, to the pathology of cough. Cough, being essentially a reflex and involuntary act, may be considered salutary in so far as it assists nature to clear the tubes and get rid of viscid or irritating mucus. In the adult this involuntary act is largely supplemented by voluntary effort: in the young child such is not the case, and the patient is placed at a distinct disadvantage so far as the extra effort is concerned. There can be no doubt that the absence of this voluntary power is a not unimportant factor or link in the chain of causes tending to induce pulmonary collapse. In enumerating the causes of defective breathing power, we must look to the entire respiratory apparatus,

and here, we find, that in any part of it altered physical conditions may arise which tend to produce atelectasis. Thus, in the

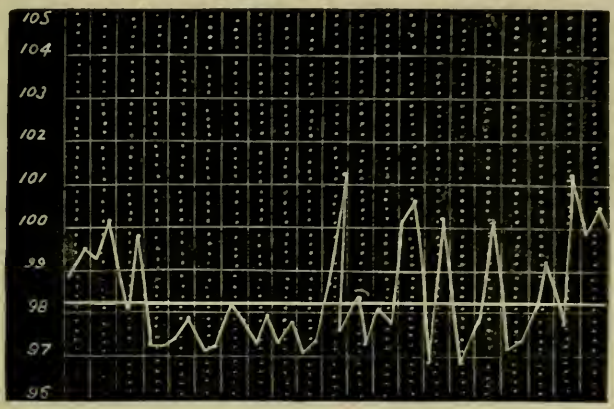


Fig. 2.—Bronchitis; Pulmonary Collapse; Catarrhal Pneumonia in a child 14 months old. Low temperature range indicates period of collapse.

chest walls, in the abdomen, in the nares, larynx, trachea, or bronchi, we may meet with conditions giving rise to it. Weakness of the thoracic parietes, whether of bones or muscles, and associated with this, a general condition of debility and loss of muscle and nerve tone, as seen in rachitic children, in whom, when there is any bronchial catarrh, as there generally is, and when this is associated with a loss of rigidity in the bony framework of the chest, you have pulmonary collapse to a greater or less extent almost invariably present. In like manner, when from

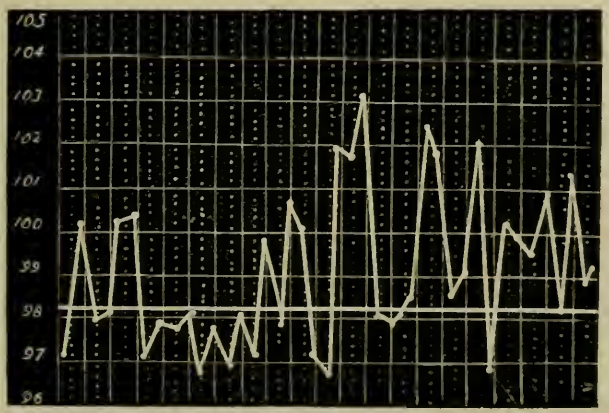


Fig. 3.—H. M., æt. 2; Acute Bronchitis; Collapse; Catarrhal Pneumonia; Death.

whatever cause the abdomen is distended, we have, as a natural result, an obstacle to the free descent of the diaphragm, and con-

sequent weakening of the inspiratory act, which acts directly in the production of collapse. Nasal or laryngeal or tracheal, as well as bronchial stenosis, from whatever cause, will likewise tend to produce it. Thus, in croupous or diphtheritic laryngitis, or laryngismus stridulus, we meet with it. Before alluding to causes in the bronchial tubes themselves, I wish merely to refer in passing to the question, which the limits of the paper forbid my discussing, how far any or all of these causes may operate in the production of collapse without the concomitant existence of bronchial catarrh. There are grounds for believing that in atrophied and debilitated children, with rickety deformity of the chest, atelectasis may be gradually and slowly produced by physical causes apart from any intra-bronchial plugging or occlusion. There can be no doubt, however, that in the larger proportion of cases bronchial catarrh pre-exists, and, as a result, gradual blocking of the tubes with secretion directly causes collapse. The pathology of "plugging" of the tubes, as it is called, has been carefully worked out ever since Lænnec opened up the subject in his classical writings. I need only mention the names of Hutchinson, and of Gairdner,[1] who, in his excellent monograph—a model of exact clinical and pathological observation—has clearly shown the mechanism of its production. The old views of Lænnec regarding the relatively weaker power of the expiratory as compared with the inspiratory act have been disproved by almost all observers since his time. Hutchinson and Mendelsohn[2] prove conclusively that the forced expiratory act is one-third more powerful than the inspiratory act. This fact, as proved also by Gairdner and Traube, is one of the most powerful factors in the production of pulmonary collapse, especially when the bronchial tubes are obstructed by secretion. The "plug" theory of Gairdner has been abundantly proved, and presupposes the existence of viscid mucus plugging up the tube at a particular part. There can be no doubt that when we have viscid or partially solidified secretion occluding a tube of greater or lesser dimensions, the mechanical effect is such that, during the coughing and respiratory acts, the mucus acting in a valvular manner allows more readily the exit than the entrance of air into the alveoli, which ultimately become atelectic. Judging from a large number of cases of pulmonary collapse in children in which I have examined the bronchial tubes, they have been almost invariably filled with fluid mucus of a more or less viscid nature, so I am inclined to think, that, in children at all events, the consistency of the mucus is generally fluid, seldom inspissated to such an extent as to form the more or less solid plug graphically described by Gairdner, and that collapse takes place from a slow damming up of the tubes, the air being gradually forced out by the relatively stronger expiratory power, or the entrance of air prevented, in

[1] *Pathological Anatomy of Bronchitis.*

[2] Reid, *Resp. Cyclopd. Anat. Phys.*, Part 32, p. 336.

which case that contained in the alveoli is gradually absorbed,—a result which, we know from the observations of Fuchs, is almost certain to be brought about. The secretions in the bronchial catarrh of children are generally believed to be relatively more copious and fluid than in adults. Whatever be their condition, the same result obtains with probably equal facility.

The only other cause of pulmonary collapse to which I shall allude, is the probability of the temporary occlusion, partial or complete, of the smaller bronchial ramifications by spasmodic contraction. Lænnec, and after him Trousseux, and most other writers on the subject, have alluded to this. Trousseux, in proof of the existence of this contraction, has found therapeutically that belladonna, from its well-known action on the vagus in lessening vascular congestion of the mucous surface, diminishing secretion, and relieving spasm, is a most efficient drug in treating such cases. In young children, especially those in previously good health, and in whom reflex nerve action is excited with great readiness, it seems probable that this is not an unimportant factor in the production of pulmonary collapse, especially the slighter form of the complication. In fact, it is difficult to account for its production except on some such theory in the slighter forms of the disease, when there are no signs of any secretion in the tubes. The exact conditions and relations of the bronchial muscles in acute catarrhal conditions require elucidation. One cannot doubt that reflex spasm, as is generally supposed, must seriously affect the ingress and egress of air. A further development of the spasm, ending in more or less paralysis of the muscular wall, especially if accompanied by swelling of the mucous membrane, would tend to produce the same effects.

In a paper read to this Society lately by Dr M'Bride,[1] he alluded to the recent interesting observations of Huck on the erectile tissue of the inferior turbinated bodies in the nose. Stenosis of the nares in young children often plays an important part in the production of pulmonary collapse. Nasal catarrh is of common occurrence in infants, and is directly dangerous in proportion to the rapidity and completeness of the occlusion. It is still a debated point whether erectile tissue exists in the bronchial mucous membrane. If it does, there can be little doubt that it would readily account for the rapid closure of the tubes which occurs in the slighter forms of bronchial catarrh in comparatively healthy children.

I have said enough regarding the etiology of this condition to show that the causes are various and often complex. The importance of a thorough appreciation of these is obviously necessary in view of any rational treatment of the disease. What, then, are the clinical features of these cases? How do we recognise it during life? From what has already been said, it will be obvious that we meet with varying degrees of pulmonary collapse, from

[1] *Medico-Chirurgical Transactions*, vol. iii.

atelectasis of a limited number of lobules (lobular collapse) to that of larger portions of lung (lobar collapse). As would naturally be expected, the symptoms vary much in intensity according to the extent of lung involved, and the pathological conditions otherwise accompanying it. The clinical recognition of this complication is usually easy in direct proportion to the amount of lung involved, and the rapidity with which the collapse takes place. In those cases in which it is slowly and gradually induced, we do not meet with those well-marked symptoms which obtain when the child is *suddenly* deprived of the use of a large portion of lung. The cases can readily be divided into two classes:—

A slighter form, occurring often in otherwise healthy children suffering from mild bronchial catarrh. In such cases the symptoms and signs are often comparatively neither serious nor pronounced, and may frequently be overlooked or misinterpreted. When recognised and suitably treated, inflation of the collapsed lobules takes place and the child recovers. Perhaps I can best illustrate the clinical features of the slighter form of pulmonary collapse by referring to one or two cases in point.

In December last year I was asked to see, in consultation with a medical practitioner, a bottle baby about four months old. The child had been ill for a week with slight symptoms of bronchial catarrh, the older children in the house all having had cold about the same time. The baby had previously presented no serious symptoms except slight sneezing and cough, with restlessness and intermittent suckling, and no constitutional disturbance otherwise. The night before I was asked to see the infant it had turned suddenly worse, becoming heavy and drowsy, refusing the bottle, the breathing being somewhat accelerated. On examination I found the child breathing 80 per minute; pulse, 130; temperature, 99°; anterior fontanelle somewhat depressed; superficial veins of head and anterior part of thorax prominent. On inspection of the chest, there was little movement and no indrawing of the ribs during inspiration at any part, the respiratory movement being chiefly abdominal. On auscultation the breathing was loud and freely audible all over the chest, and accompanied by occasional and scattered sibilant sounds, except over a limited space about 1½ inch square on the right side posteriorly near the base, where the breathing was faint and feeble, and the percussion resonance slightly impaired. I ordered the infant, as it had ceased to take its bottle, to have a tablespoonful of sac whey every hour and a half, for which it was to be wakened out of sleep, and, if possible, made to cry; sudden cold applications, if necessary, to the chest; to lie on the sound side; and a light cotton wool jacket to envelope the chest, and the flannel binder to be removed from the belly; ℥v. of sp. ammon. arom., with ℥j. of sp. chloroform, to be given every two hours alternately with the food. In two days the child had resumed its natural appearance and begun to take the bottle, the

breathing became louder and stronger over the affected part, and a few fine crackling râles could now be heard, which soon disappeared.

A second case was that of a little girl one year old, who had been suffering from slight bronchial catarrh for about ten days. She appeared to be going on favourably, but on the tenth day I was sent for to see her, and found the breathing much accelerated. Previously the respirations had been hardly above normal, but now they numbered 68 per minute, the pulse being 130, temperature 99°·2. Examination of the chest showed scattered sibilant rhonchi, with occasional crackling in the interscapular region and towards the bases of both lungs. The respiration was exaggerated at parts, and generally of unequal intensity, but no definite localized signs of pulmonary collapse could be detected. The existence of lobular collapse was, however, diagnosed as probable, and the further progress of the case corroborated this. The chest had been previously covered with a cotton wool jacket. A liniment of ammonia and camphor was ordered to be applied. She was given two ounces of milk, with a few drops of brandy and six drops of tr. belladonna, every three hours, for which purpose she was to be roused from sleep if necessary. In four days the aggravation of symptoms had disappeared, the respirations coming down to 40. The only alteration in physical signs was the occurrence of copious crepitant râles over a limited area towards the base of the right lung posteriorly. She got rapidly well. Such cases as these are not unfrequently met with. Many may be diagnosed with certainty from the occurrence of well-marked physical signs along with the usual symptoms. In others the physical signs are either absent or at first indistinct, yet the general features and termination of the case leave little doubt as to the existence of limited pulmonary collapse. The danger in all such cases, especially if they are unrecognised and not treated, is the occurrence of catarrhal pneumonia in the collapsed patches.

The second and more serious form of pulmonary collapse is met with in the severer forms of bronchial catarrh, in which the collapse is generally more extensive, and the symptoms and ultimate result of the complication much more serious. In such cases the reinflation of the collapsed lobules is the exception and not the rule. In capillary bronchitis in young children this complication is of great frequency, and generally leads on to catarrhal pneumonia. So common is its occurrence, that I believe you rarely meet with cases in which the ultimate bronchial ramifications are involved in an infant without the existence of collapse to a greater or less extent. It may be very limited, and, as in the milder form of catarrh, affect a few scattered lobules, or it may involve large portions of lung substance. In the former case the symptoms are less prominent, and physical signs are usually absent; in the latter the condition gives rise to well-marked symptoms, and frequently the physical signs are distinct.

The symptoms of extensive pulmonary collapse are prominent *in proportion to the rapidity with which the collapse takes place.* In cases where the air is slowly expelled from the lobules, by gradual occlusion of the smaller tubes, there are often no marked symptoms; on the other hand, when, from whatever cause, the collapse is sudden, as when a large bronchus becomes plugged, the symptoms present a more marked character and admit of easy recognition. In such cases, what are the clinical features of the disease? In a case of extensive bronchitis, when rapid lobar collapse takes place, there is usually a marked change in the symptoms. The child becomes greatly distressed, often more restless; the countenance is anxious, the lips livid, the alæ nasi move actively; the respirations become more hurried and shallow, frequently as high as 70 to 80 per minute; the pulse is small and compressible. The pulse respiration ratio is markedly perverted. The temperature does not, as a rule, show a corresponding rise; in some cases there may be a fall. The cough becomes markedly altered in character and frequency, is sometimes almost suppressed; at all events, it loses its harsh bronchial character, and becomes much more feeble and shorter. The child generally refuses food; if at the breast it stops sucking altogether. Along with these symptoms the physical signs become altered. During inspiration there is more or less indrawing of the ribs and intercostal spaces over the lateral aspect of the chest on one or both sides. There is high pitched percussion resonance, often well-marked dulness over the base of one or both lungs, or along the line of the spine. The percussion dulness is, however, often masked by the emphysematous lung around the collapsed portion, so that we sometimes get a hyper-resonant note rather than a dull one. On auscultation the breathing is shallow and feeble, and generally of a faintly bronchial character. There are usually no respiratory accompaniments at first, other than those previously audible, but in the course of a day or two fine crepitant râles may be heard from the congested lung substance in and around the collapsed portion. In the further progress of such cases, one of three things is likely to happen. As I have already said, in lobar collapse in severe bronchial catarrh reinflation rarely takes place to any extent. The collapsed portion may remain *in statu quo,* the child may die suddenly, or catarrhal pneumonia may be set up.

I now pass on to the consideration of acute catarrhal pneumonia. No more interesting class of cases is met with in the clinical study of disease in children than these. They are of interest, not only from their frequency, but on account of the variation of the symptoms, and the inconstancy of the physical signs as compared with similar conditions met with at later periods of life. No one who has not given close attention to the clinical features of these cases in early life would believe how variable and rapidly changing are the physical signs of pneumonia in the child. Well-marked signs of

consolidation may be present one day, which from alteration in the physical conditions, due perhaps to emphysema or collapse, may be quite changed in a few hours. In children, without doubt, we meet

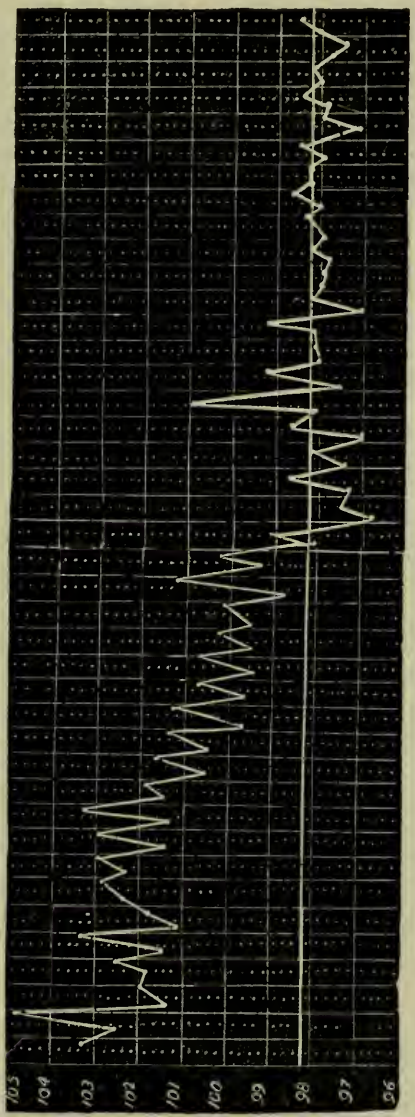


Fig. 4.—J. D., æt. 7; Acute Catarrhal Pneumonia; Recovery.

with a true fibrinous pneumonia as well as the catarrhal form of the disease, with symptoms and physical signs so distinct as to leave no doubt as to its exact nature, but there is a large class of cases

where, clinically, the line is by no means easily drawn between the two diseases. The old distinctions between lobar and lobular pneumonia are of comparatively little value in the child, as we meet with cases of lobar catarrhal pneumonia which at first sight, at all events, are not so readily distinguished from the croupous variety of the disease. All observers are agreed that the acute catarrhal pneumonia of childhood is essentially a disease of early life. What, then, are its distinguishing characters? The first fact to lay hold of is, that it is a secondary disease, closely associated with, generally complicating, bronchial catarrh. It occurs during the progress of this disease especially when the ultimate bronchial ramifications are involved. Clinically it is difficult, often well-nigh impossible, to distinguish between capillary bronchitis and acute catarrhal pneumonia. Probably capillary bronchitis rarely occurs in a young child uncomplicated by catarrhal pneumonia. The recognition of the occurrence of this complication, as a rule, presents few difficulties. The previous existence of bronchial catarrh itself, if extensive, affords strong presumption of its occurrence. The diagnosis may be assured by a consideration of the general clinical features of the case, more particularly as regards symptoms, physical signs at the commencement, and when the disease is limited in extent, and possibly confined to a central portion of lung, being often indistinct in their character. When larger portions of lung are involved the physical signs are well marked, and give clear indication of the true nature of the complication.

I have already sketched the symptoms of bronchial catarrh, whether of a slight or severe character, and in order to a recognition of the occurrence of catarrhal pneumonia it is necessary to keep them in remembrance, and to note the changes in the clinical features of the case which the supervention of catarrhal inflammation of the alveoli gives rise to. Let us, by way of illustration, again picture the case of child suffering from extensive bronchial catarrh. The hurried breathing, the constant harsh cough, often paroxysmal in its nature, the accelerated pulse, the anxious and distressed look, the disinclination for food or playthings, the foul tongue, the unhealthy stools, the more or less frequent vomiting of undigested food and mucus. All the while the temperature is not very high, ranging from 99° to 101°, with no great variation, its ratio to that of the pulse being pretty constant. Let us note the changes which take place in the supervention of catarrhal pneumonia. Its onset is signalized by a marked change in the symptoms from those of the ordinary bronchial catarrh which has preceded it. Probably one of the first noticeable alterations in the symptoms is the cough, which invariably changes its features. It loses its purely bronchial character, and becomes shallow and short and hacking, and apparently accompanied by pain during the act. The cough may be more frequent—often very constant—and irritating, but sometimes one of the most characteristic features

is its diminished frequency. At the same time the respirations are much accelerated and shallower than before, running up to 50 or 60, or even more, in the minute—the alæ nasi acting rapidly. The pulse becomes much quicker, and its ratio to the respirations markedly perverted. The temperature rises to 103° or 104°, or even higher, and at the same time alters as regards its type. From the comparatively regular temperature of bronchitis it becomes markedly of an irregular type with decided remissions, the rise generally occurring in the evening with considerable morning fall. In no class of cases is the graphic method of recording temperatures of more value, as by it alone we can often diagnose the supervention of catarrhal pneumonia. The child lies quietly and does not cry so much, nor does it resist physical examination to the same extent as before. This is always a serious sign in acute lung affections in the child. There is generally considerable disorder of digestive functions of the nature already referred to in uncomplicated severe bronchitis. The physical signs next demand our attention. We can generally acquire valuable information in these cases by simple inspection of the chest. In normal respiration in young children, what strikes the observer at once is the comparative absence of thoracic movement as compared with the adult, the respiration being chiefly abdominal. In collapse of

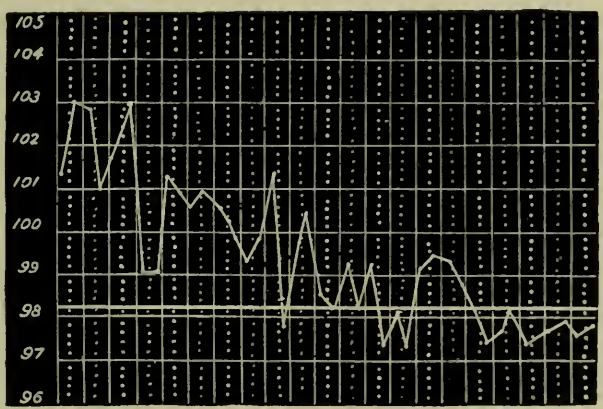


Fig. 5.—Acute Catarrhal Pneumonia in a Child, aged 2; Recovery.

the lung and catarrhal pneumonia the movements of the thoracic walls are generally characteristic, the indrawing or retraction of the ribs and intercostal spaces during inspiration being distinctly marked, more especially in rickety children, where the softness of the bony framework of the chest brings this into greater prominence. The retraction is noticed chiefly in the lower lateral parts of the chest. On auscultation and percussion the signs vary very much according to the extent of the disease, the number of lobules

affected, their contiguity to one another, and their proximity to the chest wall. In some cases where the patches are small and not near the surface, the signs of consolidation are not well marked or altogether absent, and we are forced to base our diagnosis on symptoms alone, which, if they are of the characteristic nature already described, leave little doubt as to the true nature of the case. As a rule, however, physical signs are sufficiently distinct. The percussion note loses its natural resonance, and becomes impaired in proportion to amount of consolidation and the proximity of the patch to the surface. Where much healthy lung substance or surrounding emphysema intervenes between the consolidated portions and the surface, the resonance may appear natural or little impaired. On auscultation crepitant *râles* are heard accompanying both inspiration and respiration. These are very different and much coarser than the fine crepitation heard at the end of the inspiratory act in croupous pneumonia. The *râles* persist during the whole course of the disease, and do not disappear, as in croupous pneumonia, at its height. The respiration is usually of a broncho-vesicular character, and the voice resonance intensified.

Catarrhal pneumonia, unlike the croupous disease, is of indefinite duration, without any distinct crisis. The further progress of such cases is generally characterized by the more pronounced character of the symptoms. The physical signs usually become more distinct as the pneumonic areas enlarge or coalesce. When the child recovers it does so slowly, a gradual improvement in both symptoms and physical signs becoming manifest. If within a fortnight there are no signs of abatement, the case generally runs a subacute course, and may terminate favourably at the end of six or seven weeks; or the disease may become chronic, convalescence being indefinitely delayed; or it may be ultimately complicated by the supervention of tuberculosis.

I have already referred to gastro-intestinal complication in the bronchitis of children, and shall make a few additional remarks on it before passing to the subject of treatment. I should like to emphasize the importance of the gastro-intestinal complication of the bronchial catarrhal affections of children, not only on account of its frequent occurrence, but of its danger and the necessity of early recognition and prompt treatment. A catarrhal condition of the stomach or bowels, or of both combined, is present in a large proportion of cases of bronchial catarrh. Such complications seriously interfere with the assimilation of food, and increase the febrile disturbance and general distress of the child, and often lead indirectly to a fatal termination. The catarrh is essentially secondary in its nature, and probably induced by the swallowing of the irritating secretions from the bronchial tubes. Young children, as is well known, do not expectorate but swallow the mucus, and the frequency of the occurrence of gastro-intestinal complication is, I believe, in direct proportion to the infrequency of vomit-

ing in these cases. Every one who has had much experience of bronchial catarrhal disease in children know the relief experienced after vomiting, the expectoration being thus removed, and an obvious source of irritation eliminated. If the child does not vomit from time to time, and get rid of the catarrhal secretions which have been swallowed, a secondary catarrh is apt to be set up in the stomach, often extending into the bowels, causing indigestion and diarrhœa, with defective assimilation of food.

The usual signs of gastro-intestinal catarrh are well marked, the tongue red and thickly coated at first, sometimes desquamating afterwards, nausea, disinclination for ordinary food, thirst, vomiting, with more or less mucus sometimes streaked with blood, diarrhœa, offensive stools, deficient in bile, with undigested food and mucus, often becoming more watery as the case goes on. When there is vomiting alone, the complication is not so serious as when the catarrh has passed down the tube and you have constant diarrhœa. In any case, as I have already said, these complications add greatly to the gravity of the case.

The treatment of bronchitis and its complications must now demand our attention. At the outset, I need hardly say that a correct recognition of the exact physical condition we have to deal with in the lung is a necessary preliminary to successful treatment. I shall allude to the management of such cases under three heads—Hygiene, Diet, and Medicine—and in the order of their importance, for I believe that in this class of diseases in children the administration of drugs is of secondary importance to the details of hygienic and dietetic management, and, as in the treatment of disease in children generally, more success in practice is derived from the attention to little details than anything else. In treating of cases of pulmonary collapse I have already made reference to the treatment adopted, and, as it differs in some respects from that of ordinary uncomplicated bronchial catarrh or catarrhal pneumonia, I shall now allude to the principles on which it is generally agreed such cases should be treated. The end we desire to attain in a case of acquired atelectasis is, if possible, reinflation of the collapsed portion, and there can be little doubt that in a certain proportion of cases this can be brought about. I believe in many of those cases, examples of which I have recorded, where in the milder cases of bronchial catarrh the smaller tubes remain unaffected, sudden collapse occurs, prompt and energetic measures will suffice to restore the lung to a natural condition. In extensive capillary bronchitis it may be doubted whether complete or partial reinflation ever takes place. The first indication in treatment is to promote and encourage free respiration, more especially the act of inspiration. For this purpose the child's clothing must be light and loose, the abdominal bandage in infants should be removed. The child should be made to lie on the sound side in the case of one side only being affected, so as to allow the affected side full play.

It should not be allowed to sleep or lie too long, such children being often very drowsy, but should be taken up at intervals, and made to cry if possible. The nurse may be instructed to cool her hand by placing it in cold water and applying it suddenly to the chest, in order to induce a sudden inspiration. The room should not be too hot, and well ventilated. Stimulating epithems may be applied to the chest, such as hartshorn, mustard, or turpentine. The child should be fed regularly with food suitable to its age. Sucking babies often refuse to take the breast, and need to be fed with the spoon. In any case the child generally shows a disinclination for food, and only takes a little at a time, and therefore should be fed more frequently. Whatever be the age of the child, it generally requires stimulants, and a few drops of brandy, or in the case of a sucking child sac whey, should be given. The most serviceable medicines are those of a stimulating nature, such as sp. ammon. arom., or subcarbonate of ammonia, which should be given in small doses, frequently repeated. Belladonna is undoubtedly of use in those cases of collapse occurring suddenly in slight catarrh in comparatively healthy children, more especially where we have reason to believe there is temporary occlusion of the tubes from nervous or spasmodic or reflex causes. The drug should be given in full doses, and repeated with sufficient frequency to insure a sedative effect. The influence of the drug in this class of cases is generally most marked in diminishing the tension of the bronchial muscles and allaying reflex excitability, thereby facilitating the ingress of air to the collapsed portions. The drug is of no use in the more serious cases of collapse occurring in capillary bronchitis accompanied by catarrhal pneumonia.

In *acute bronchial catarrh* the hygienic management first demands attention. The cot should be placed, if possible, in a corner of the room near the fire, the room should be properly ventilated, and the temperature maintained at a range of between 65° and 70°. The child's clothing should consist of a warm flannel night-dress if in bed; in the case of an infant in arms it should, in addition, be kept in a light woollen shawl or blanket extending below the limbs; the belly binder should be removed. The atmosphere of the room should be kept moist. The main indications of treatment are to arrest the progress of the disease and prevent its extension to the smaller tubes, to favour secretion and increase fluidity, or, if you like, diminish viscidity of the discharge from the inflamed mucous surface. Various measures may be adopted to effect this. If the child be an infant, and remain a good deal in the nurse's arms, she should sit at the side of the fire. A bronchitis kettle may be kept steaming on the fire. There are other means of equal efficacy in moistening the air, and one of the best is keeping a small screen—a clothes screen answers the purpose well—around the child, and covering it with a wet sheet. Very rapid evaporation takes place, so that the sheet, provided the tem-

perature of the room be kept high enough, requires to be redipped every hour or hour and a half. A flat sponge bath, with about an inch deep of water in it, may be kept in the centre of the room or near the bed. When the child is in its cot we must modify our plan so as to suit the situation by surrounding the cot with a tent, and there are two methods generally adopted of moistening the air. We may either keep a kettle steaming into the bed, which I think the least efficient of the two, or hang wet towels all round the inside of the cot upon a cord suspended for the purpose. After a trial of this method for many years, I can with confidence recommend it. By this means the air of the cot is kept quite as moist, if not more so, than by means of the steam kettle, which I now seldom use in Hospital except in croup cases, in which, after tracheotomy especially, we can direct the steam close to the tube if necessary. Having placed our patient under favourable hygienic conditions, the question of feeding should next be attended to. The child should be put upon light nourishing food suited to its age, and only such quantity administered as it is able to digest. Suckling children require little change in feeding unless signs of gastro-intestinal catarrh show themselves, when suitable alterations must be made according to circumstances. In spoon babies the diet should consist of light soup, beef, chicken, or veal, tea and milk, whisked white of egg, etc., all farinaceous food should be interdicted, as it is apt to favour the production of indigestion. As a rule solid food should be either withheld, or given in only small quantity at long intervals. Care must be taken in any case not to overload the stomach, but rather to feed frequently in small quantities; this is particularly necessary in gastro-intestinal complications. In such cases the milk should either be alkalinized with bicarb. of soda, or lime water, or peptonized. The stools should be regularly examined from day to day, and if unnatural, the food must be altered either as regards quality or quantity. In gastro-intestinal catarrh, besides careful regulation of feeding as to both quantity and quality, we ought to administer, if need be, such remedies as bismuth, or aloes, or rhubarb, combined with alkalies. Occasionally a dose of hydrarg. c. creta or calomel may be indicated. In intestinal catarrh the combination of hydrarg. c. creta with pulv. ipecac. c. opio is useful. One or two grains of dried sulphate of iron, as recommended by Dr Eustace Smith,[1] is often of service, given every four hours in mucilage, in the gastric form of catarrh.

The question of the administration of stimulants in children is important. The condition of the pulse and the general nerve tone of the child in connexion with the extent of the disease or nature of the complication must be our guide. It may be stated generally, that in most severe cases of bronchial catarrh of long continuance, and in catarrhal pneumonia, stimulants are required in greater or

[1] *Disease in Children.*

lesser quantity sooner or later. Whenever the pulse becomes compressible or irregular the indication is clear for their administration, and frequently at the same time it may be desirable to give a few drops of tinct. of digitalis. Brandy on the whole is the most useful stimulant, generally preferable to wine. It should be given in small doses, frequently repeated, along with food, and its effects carefully noted. If wine be used, the time-honoured sac whey is as good a form as can be selected.

I should like next to allude to external applications. Acute bronchial catarrh in children is generally relieved by rubefaction of the chest, and local diaphoresis produced by suitable means. By keeping the cutaneous capillary circulation in a state of activity, we have a ready and direct means of relieving the congested condition of the pulmonary circulation. Rubefaction may be produced by the application of sinapisms, care being taken not to continue this too long in case vesication takes place, which is apt in infants to result from their too potent or prolonged application. Mustard is one of the most ready and efficient means at our disposal, and as a rule it is best applied in the forms of the ordinary cataplasma sinapis, of the strength of one part of mustard to four or five of linseed meal, made into a jacket poultice, and kept on till the skin is well reddened, from fifteen or twenty to thirty minutes, until the necessary effect is produced. Rubefaction may be produced also by the application of diluted lint. ammoniæ or lint. terebinthinæ, in which case the liniment should be painted over the entire chest, which is afterwards encircled with cotton-wool. Having produced rubefaction of the cutaneous surface, our endeavour should be to keep up the activity of the skin and avoid any revulsion or chill. The time-honoured poultice of linseed or other emollient substance applied in the form of a jacket is a means of doing this, but I think neither the most convenient nor suitable for the purpose in the majority of cases. My objections to linseed poultices in young children are that they are heavy, dirty, and unctuous, and do not keep up the action of the skin so well as other applications to be hereafter noted. Another objection to poultices is that, except in hospital, or in private practice, when you have the advantage of a skilled nurse, it is difficult to get them properly made and applied. A poultice badly made and improperly applied, and allowed to get cold, is worse than useless. Another objection is, that in young children, who are constantly moving, and require perhaps to lie in the nurse's arms, the poultice is apt to get crumpled up and lumpy. I am quite sure I have seen the most evil results in private practice from the careless application of poultices, and I consider it to be the duty of the practitioner, if he think it desirable to order them, to see that they are properly made and applied. It is not sufficient to write a prescription and order a poultice, but to see the details of treat-

ment carefully carried out in every respect. The practice that I have now followed out for many years, and which I notice is now in favour with other practitioners in treating the acute bronchial and other chest affections in children, is, after suitable rubefaction of the surface has been produced, and the secretion of the skin excited to activity, to encase the chest in a light cotton wool jacket. This serves the purpose of keeping up a uniform temperature on the surface, and answers admirably. The jacket may be made and applied in three different ways; the cotton wadding, which must be the common sheet wadding used by tailors and dressmakers for padding, may be basted on a fine cotton or linen jacket, or on to a thin macintosh cloth jacket, or this jacket, instead of being applied dry, may be squeezed out of water before application, in which case we have a clean and light poultice, which can be worn continuously. In choosing your method of application I am in the habit of being guided by the condition of the skin. If with the simple jacket it does not act sufficiently, the substitute of the macintosh covering generally produces sufficient diaphoresis for our purpose, if not, the cotton wool may be moistened in the way indicated. In applying the wet cotton wool jacket the wool requires renewal every second day, perhaps oftener. If preferred, soft old linen may be used instead of cotton wool, and then we have an application exactly similar to the ordinary abdominal compress. Whatever measure we adopt to attain the desired end, I hold that it is beneficial in these acute chest cases to stimulate the action of the skin and keep up local diaphoresis. Medicated cotton wool is often of service. Salicylic wool, or pinewood oil wool may be used. A very convenient and ready method of medicating the cotton is to sprinkle over the jacket before it is applied a few drops of oil of eucalyptus, pinewood oil, or terebene. Whichever method is adopted, I feel sure that these applications are in the case of children more suitable and convenient in every way than the old emollient poultices. I have not yet had the opportunity of trying cold compresses or ice-bags in the pneumonia of children, but from the success of the practice in certain cases in the hands of others, I should think it to be justified. *Other outward applications* may be of service, especially dry cupping, or the application of one or two leeches in the interscapular region or over the base of one or other lung. Local bleeding is especially useful in some cases of pneumonia where there is evidence of impediment of action and congestion of the right heart. Impending death may be often averted by timeous local depletion in such cases.

The administration of drugs in acute bronchial catarrh and its complications demands careful consideration. The routine treatment too often in vogue of giving ipecacuanha or squill cough mixtures, with the indiscriminate application of poultices, cannot be too strongly deprecated. Every case should be treated strictly

on its own merits, and with due regard to the constitutional peculiarities of the child, remembering the principle which we cannot too often recall, that it is not so much the disease that we have to treat, as the disease as it exists in the patient specially under observation at the time. In hospital practice, where one is untrammelled by the necessity of ordering drugs to please the patient or his friends, I very often treat ordinary cases of mild bronchial catarrh without the administration of any medicine except an aperient, or it may be an emetic, trusting solely to hygienic and dietetic management on the lines I have already indicated. In severe cases, however, the benefit derived from carefully selected therapeutic measures is of great value.

The classes of drugs of special service belong to the emetics and expectorants.

Emetic remedies are among the most useful and powerful means at our disposal of promoting the bronchial secretion and emptying the tubes. They must not be used as a routine practice in all cases, but with discriminating care. I have already alluded to the frequency of natural emesis. It is therefore obvious that when this takes place from time to time it will be unnecessary to produce vomiting artificially. The indications for the use of emetics are constant dry cough with deficiency or dryness of the secretion, high fever, with full strong pulse, and deficient action of the skin. An emetic of apomorphia or sulphate of zinc, with or without ipecacuanha, or of ipecacuanha alone, seldom fails to give relief to the symptoms, by promoting the secretion of both bronchial mucous membrane and skin. Care should be taken in the administration of this class of remedies in debilitated children, as they are sometimes apt to produce great depression. It may be said generally that emetics are more suitable in the earlier than the later stages of the disease, in sthenic than in asthenic cases, and that in cases complicated by catarrhal pneumonia their employment is often of doubtful value.

In regard to the use of expectorant remedies, judicious selection is necessary according to the exigencies of the case. All empirical and routine treatment should be avoided. Choice must be made with due regard not only to extent of the disease and the exact pathological conditions, but with reference to the constitutional peculiarity of the child, and the state of the circulation and the bronchial secretions. In a strong child, during the earlier stages of severe bronchial catarrh great relief is obtained from the use of the sedative circulatory expectorants, such as antimony, apomorphia, or ipecacuanha, with or without alkalies. The effect of these remedies is often most beneficial, but their action must be closely watched, and their administration stopped towards the height of the disease, or when any symptoms of depression of the circulation, or otherwise, become manifest. Children do not bear the administration of this class of remedies as well as adults, or, at

all events, do not stand a long continuance of their administration so well. After the height of the disease, or in cases where there is a tendency to debility or feebleness of circulation, ammonia in the form of aromatic spirits or subcarbonate, or small doses of the hydrochlorate combined with senegæ, or with minute doses of that most valuable of all stimulants of the respiratory centre and nerve respiratory apparatus, strychnia, will be found of great service. Perhaps the most useful of all the expectorants in children are the saline, the alkaline carbonates, or the citrate of potash, combined with minute doses of the sodium or ammonium iodide. The effect of these drugs in promoting expectoration by increasing the fluidity of the secretions is of great service. They may be given early in the disease and continued to its height, thereafter being combined with senega or tinct. of nux vomica. There is another class of remedies which I cannot conclude without alluding to,—I refer to the terebinthinate ones, such as eucalyptus turpentine, terebene, and such like. As a class they are more useful in the more chronic forms of the disease, with the exception of terebene and eucalyptus,—the latter used as an inhalation, the former internally. They seem to be antiseptic and antispasmodic; especially do I consider the latter action to be associated with terebene. It seems specially useful in cases where there is deficient secretion associated with bronchial muscular spasm. Two or three drops given along with the child's food often gives great relief to the cough, and otherwise allays irritation.

In acute catarrhal pneumonia the use of emetics requires great caution, and is often contraindicated by the feeble condition of the child. If I am asked what are the special lines of treatment in this complication, in addition to those laid down for ordinary severe bronchitis, I should say the main indications are,—to support the patient's strength by suitable diet, and stimulants if need be, and they are generally required, so as to give the child stamina to cope with this disease, the duration of which is usually indefinite and a sore tax on the vital power. Avoid the use of continuous moist poultices as a rule, preferring intermittent rubefaction or blisters of small size. As to drugs, antipyretics are often needed. The class of ordinary expectorants is usually contraindicated, except those of a stimulating nature. Most reliance must be placed on tonic doses of quinine or nux vomica, after the first week or ten days.

The limits of this paper forbid my going more fully into the medicinal treatment of the bronchial catarrh in children, but I trust I may have said enough to show that the administration and choice of drugs in treating these ailments in early life requires even more care and discrimination than in the same diseases at later periods.

Owing to the lateness of the hour there was no discussion.

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PRINTED BY OLIVER AND BOYD, EDINBURGH.